

**Allied Paper, Inc./Portage Creek/  
Kalamazoo River Superfund Site  
Kalamazoo, Michigan**

**Final Technical Memorandum 14  
Biota Investigation**

**Appendix E  
Data Quality Review Reports  
Volume I**

January 2002

*Technical  
Memorandum*

**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 39990  
PCB ANALYSES**

**TERRESTRIAL BIOTA - EARTHWORMS**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**

**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

There is no specified holding time for extraction of biota samples; however, all samples must be analyzed within 40 days of extraction. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

## **5. Surrogates / System Monitoring Compounds**

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K46000, K46006 and K46014. All data for these samples have been qualified as estimated. Samples K46004, K46005, K46007, K46008, K46009 and K46014MS had one surrogate recovery below acceptable control limits. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

## **6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

## **7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries were within acceptable control limits. The relative percent differences (RPD) between matrix spike and matrix spike duplicate recoveries were above the acceptable control limits. No qualifiers were added to the samples based on this deviation.

## **8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

**9. General Comments**

The recommended data usage for the sample reanalyses is as follows:

**K46010 and K46010-RE**

Sample K46010 was originally analyzed at a 1:10 dilution due to a laboratory accident during GPC cleanup procedure. The sample was subsequently re-extracted and reanalyzed undiluted. Data from the reanalysis K46010-RE should be used for all compounds.

## **DATA REVIEW CHECKLIST**

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  2  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

**PCB Data Review Checklist - Page 2**

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

# PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K46000	OK for all samples	↓ (35)	↓ (47)	↓ (33)	↓ (45)
K46001					
K46002					
K46003					
K46004		↓ (51)		↓ (50)	
K46005		↓ (51)		↓ (50)	
K46006		↓ (20)	↓ (20)	↓ (29)	↓ (28)
K46007		↓ (52)		↓ (51)	
K46008				↓ (58)	
K46009		↓ (57)		↓ (54)	
K46010					
K46010RE					
K46011					
K46012					
K46013					
K46014		↓ (17)	↓ (17)	↓ (26)	↓ (26)
K46014MS		↓ (52)		↓ (51)	
K46014MSD					

Surrogate Standards  
 TCX Tetrachloro-m-xylene  
 DCB Decachlorobiphenyl

Qualifiers:  
 D Surrogates diluted out  
 ↑ Recovery high  
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:	2/15/94 1833	2/18	2/18	2/19	2/19	2/19	2/19
Time:	10 2/16/94 1453	1845	1721	0032	0108	0818	0854
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.7 / 4.5				10.5		
Aroclor 1221	4.5 / 3.2						
Aroclor 1232	4.6 / 3.3						
Aroclor 1242	5.4 / 3.8						6.0
Aroclor 1248	4.2 / 4.2	5.0		5.0		2.0	
Aroclor 1254	4.5 / 3.4						
Aroclor 1260	3.7 / 3.4		3.5				
Tetrachloro-m-xylene	10.1 / 7.1						
Decachlorobiphenyl	5.7 / 8.2						
Affected Samples:							

# PCB Calibration Summary - Page 2

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:		2/19	2/19				
Time:		1804	1840				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		4.5					
Aroclor 1254			1.0				
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46000

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 200345

Phase Weight: 10.1 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	UJ
11104-28-2	Aroclor-1221	0.050	UJ
11141-16-5	Aroclor-1232	0.050	UJ
53469-21-9	Aroclor-1242	0.050	UJ
12672-29-6	Aroclor-1248	0.050	UJ
11097-69-1	Aroclor-1254	0.050	UJ
11096-82-5	Aroclor-1260	0.023	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46001**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 200346

**Phase Weight:** 10.0 (g)

**Date Received:** 10/09/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 1.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.024	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46002**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 200347

**Phase Weight:** 10.0 (g)

**Date Received:** 10/09/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 1.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.025	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46003**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 201526

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 5.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.5	
11097-69-1	Aroclor-1254	0.25	U
11096-82-5	Aroclor-1260	0.25	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46004**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 201527

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 2.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.4	
11097-69-1	Aroclor-1254	0.73	
11096-82-5	Aroclor-1260	0.10	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46005

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 201528

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 5.0

Date Analyzed: 02/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.0	
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.25	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46006**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 201529

**Phase Weight:** 6.7 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 1.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.075	U J
11104-28-2	Aroclor-1221	0.075	U J
11141-16-5	Aroclor-1232	0.075	U J
53469-21-9	Aroclor-1242	0.075	U J
12672-29-6	Aroclor-1248	0.92	J
11097-69-1	Aroclor-1254	0.39	J
11096-82-5	Aroclor-1260	0.075	U J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46007**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 202392

**Phase Weight:** 8.3 (g)

**Date Received:** 10/27/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 2.0

**Date Analyzed:** 02/18/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.13	U
11104-28-2	Aroclor-1221	0.13	U
11141-16-5	Aroclor-1232	0.13	U
53469-21-9	Aroclor-1242	0.13	U
12672-29-6	Aroclor-1248	1.8	
11097-69-1	Aroclor-1254	0.41	
11096-82-5	Aroclor-1260	0.13	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46008

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202393

Phase Weight: 5.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	0.69	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46009**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 202394

**Phase Weight:** 10.0 (g)

**Date Received:** 10/27/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/01/94

**Dilution Factor:** 1.0

**Date Analyzed:** 02/18/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46010

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202395

Phase Weight: 10.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 10.0

Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	0.50	U
11096-82-5	Aroclor-1260	0.50	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K46010BÉ**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 39990

**Phase Type:** BIOTA

**Lab Sample ID:** 202395R1

**Phase Weight:** 8.5 (g)

**Date Received:** 10/27/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 02/03/94

**Dilution Factor:** 1.0

**Date Analyzed:** 02/19/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.059	U
11104-28-2	Aroclor-1221	0.059	U
11141-16-5	Aroclor-1232	0.059	U
53469-21-9	Aroclor-1242	0.059	U
12672-29-6	Aroclor-1248	0.059	U
11097-69-1	Aroclor-1254	0.059	U
11096-82-5	Aroclor-1260	0.059	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46011

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202396

Phase Weight: 10.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46012

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202397

Phase Weight: 10.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.41	
11097-69-1	Aroclor-1254	0.25	
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46013

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202398

Phase Weight: 10.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.24	
11097-69-1	Aroclor-1254	0.35	
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K46014

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39990

Phase Type: BIOTA

Lab Sample ID: 202399

Phase Weight: 10.0 (g)

Date Received: 10/27/93

Injection Volume: 1.0 (uL)

Date Extracted: 02/01/94

Dilution Factor: 1.0

Date Analyzed: 02/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	UJ
11104-28-2	Aroclor-1221	0.050	UJ
11141-16-5	Aroclor-1232	0.050	UJ
53469-21-9	Aroclor-1242	0.050	UJ
12672-29-6	Aroclor-1248	0.050	UJ
11097-69-1	Aroclor-1254	0.13	J
11096-82-5	Aroclor-1260	0.050	UJ

**PERCENT LIPID RESULTS**

# Percent Lipid Results

Sample ID	Lab ID	Matrix	Results
K46000	200345	earthworm	1.28%
K46001	200346	earthworm	1.27%
K46002	200347	earthworm	1.34%
K46003	201526	earthworm	1.75%
K46004	201527	earthworm	1.95%
K46005	201528	earthworm	1.77%
K46006	201529	earthworm	2.28%
K46007	202392	earthworm	1.61%
K46008	202393	earthworm	1.98%
K46009	202394	earthworm	1.31%
K46010	202395	earthworm	NA
K46011	202396	earthworm	1.87%
K46012	202397	earthworm	1.75%
K46013	202398	earthworm	1.96%
K46014	202399	earthworm	2.50%

NA Data not available due to laboratory accident

**PERCENT LIPID RESULTS**

**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40009**

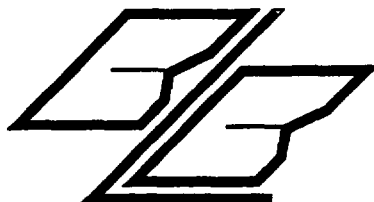
**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

## Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40009 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	Multip
K40248F	216198	bass	fillet	Battle Creek	x	x
K40248R	216199	bass	carcass	Battle Creek		x
K40249F	216200	bass	fillet	Battle Creek	x	x
K40249R	216201	bass	carcass	Battle Creek		x
K40252F	216202	bass	fillet	Otsego City Dam	x	x
K40252R	216203	bass	carcass	Otsego City Dam		x
K40253F	216204	bass	fillet	Otsego City Dam	x	x
K40253R	216205	bass	carcass	Otsego City Dam		x
K40254F	216206	bass	fillet	Otsego City Dam	x	x
K40254R	216207	bass	carcass	Otsego City Dam		x
K40255F	216208	bass	fillet	Otsego City Dam	x	x
K40255R	216209	bass	carcass	Otsego City Dam		x
K40256F	216210	bass	fillet	Otsego City Dam	x	x
K40256R	216211	bass	carcass	Otsego City Dam		x
K40257F	216212	bass	fillet	Otsego City Dam	x	x
K40257R	216213	bass	carcass	Otsego City Dam		x
K40276F	216214	bass	fillet	Otsego Dam	x	x
K40276R	216215	bass	carcass	Otsego Dam		x
K40277F	216216	bass	fillet	Otsego Dam	x	x
K40277R	216217	bass	carcass	Otsego Dam		x
K40278F	216218	bass	fillet	Otsego Dam	x	x
K40278R	216219	bass	carcass	Otsego Dam		x
K40279F	216220	bass	fillet	Otsego Dam	x	x
K40279R	216221	bass	carcass	Otsego Dam		x
K40280F	216222	bass	fillet	Otsego Dam	x	x
K40280R	216223	bass	carcass	Otsego Dam		x
K40281F	216224	bass	fillet	Otsego Dam	x	x
K40281R	216225	bass	carcass	Otsego Dam		x

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40282F	216226	bass	fillet	Otsego Dam	x	x
K40282R	216227	bass	carcass	Otsego Dam		x
K40287F	216228	bass	fillet	Otsego Dam	x	x
K40287R	216229	bass	carcass	Otsego Dam		x
K40288F	216230	bass	fillet	Otsego Dam	x	x
K40288R	216231	bass	carcass	Otsego Dam		x
K40289F	216232	bass	fillet	Otsego Dam	x	x
K40289R	216233	bass	carcass	Otsego Dam		x
K40290F	216234	bass	fillet	Otsego Dam	x	x
K40290R	216235	bass	carcass	Otsego Dam		x
K40302F*	216236	bass	fillet	Trowbridge	x	x
K40302R	216237	bass	carcass	Trowbridge		x

\* MS/MSD/DUP performed on sample

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

### 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## **6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

## **7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

## **8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>      </u>	<u>      </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>      </u>	<u>X</u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

**PCB Data Review Checklist - Page 2**

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40248F	OK for all samples	OK	OK	OK	OK
K40249F					
K40252F					
K40253F					
K40254F					
K40255F					
K40256F					
K40257F					
K40276F					
K40277F					
K40278F					
K40279F					
K40280F					
K40281F					
K40282F					
K40287F					
K40288F					
K40289F					
K40290F					
K40302F					
K40302FMS					
K40302FMSD					

## Surrogate Standards

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

## Qualifiers:

D Surrogates diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2087  
Column: RTX-35 / RTX-5

Date:	5/8/94 2109	5/11	5/11	5/11	5/11	5/12	5/12
Time:	to 5/9/94 1730	1027	1103	2106	2142	0459	0529
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	5.0 / 4.7				1.0		
Aroclor 1221	3.8 / 2.8						
Aroclor 1232	3.0 / 2.7						
Aroclor 1242	3.7 / 2.9						2.0
Aroclor 1248	3.6 / 3.1	7.5		5.0		2.0	
Aroclor 1254	9.3 / 8.9						
Aroclor 1260	3.0 / 3.0		6.0				
Tetrachloro-m-xylene	4.9 / 3.1						
Decachlorobiphenyl	8.1 / 11.8						
Affected Samples:							

## PCB Calibration Summary - Page 2

Instrument: HP2087  
Column: RTX-35 / RTX-5

[illegible]

# PCB Calibration Summary - Page 3

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:	5/18/94 1800	5/19	5/19	5/19	5/19	5/20	5/20
Time:	to 5/19/94 1254	1807	1840	2320	2358	0634	0758
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	3.9 / 4.3		11.0				
Aroclor 1221	4.6 / 5.5						
Aroclor 1232	2.9 / 3.2						
Aroclor 1242	3.6 / 3.3				1.5		
Aroclor 1248	3.1 / 3.0	1.5		0.5		4.5	
Aroclor 1254	3.0 / 3.0						4.0
Aroclor 1260	3.2 / 2.3						
Tetrachloro-m-xylene	7.7 / 5.0						
Decachlorobiphenyl	7.2 / 8.8						
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40248F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216198

**Phase Weight:** 10.0 (g)

**Date Received:** 10/12/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.079	
11096-82-5	Aroclor-1260	0.027	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40249F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216200

**Phase Weight:** 10.0 (g)

**Date Received:** 10/12/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.092	
11096-82-5	Aroclor-1260	0.039	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40252F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216202

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.26	
11096-82-5	Aroclor-1260	0.059	

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40253F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216204

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.86	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.4	
11096-82-5	Aroclor-1260	0.40	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40254F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216206

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 1.0

Date Analyzed: 05/11/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.57	
11096-82-5	Aroclor-1260	0.17	

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40255F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216208

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.48	
11096-82-5	Aroclor-1260	0.11	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40256F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216210

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.088	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.21	
11096-82-5	Aroclor-1260	0.061	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40257F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216212

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.71	
11096-82-5	Aroclor-1260	0.19	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40276F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216214

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.55	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.98	
11096-82-5	Aroclor-1260	0.15	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40277F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216216

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 2.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.68	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40278F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216218

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.65	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40279F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216220

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.31	
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.055	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40280F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216222

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 10.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	3.4	
11096-82-5	Aroclor-1260	0.33	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40281F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216224

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.57	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.45	
11097-69-1	Aroclor-1254	0.40	
11096-82-5	Aroclor-1260	0.050	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40282F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216226

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.54	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.14	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40287F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216228

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.071	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.26	
11096-82-5	Aroclor-1260	0.059	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40288F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40009

**Phase Type:** BIOTA

**Lab Sample ID:** 216230

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/10/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.86	
11096-82-5	Aroclor-1260	0.093	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40289F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216232

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.41	
11096-82-5	Aroclor-1260	0.061	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40290F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216234

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.62	
11097-69-1	Aroclor-1254	0.34	
11096-82-5	Aroclor-1260	0.11	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40302F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: BIOTA

Lab Sample ID: 216236

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/10/94

Dilution Factor: 2.0

Date Analyzed: 05/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.44	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.13	

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding time. Dilutions for samples K40252F, K40254F and K40255F were, however, analyzed over the specified holding times. All data for the dilutions have been qualified as estimated.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

## 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exception:

Instrument HP2404 - RTX5 5/20/94 01:18

2-Bromobiphenyl 55.4%

Data for this compound in samples K40302FMSD and K40302FMSD have been qualified as estimated based on the deviation.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40253F	Aldrin	49.5%
K40254F	Aldrin	75.5%
K40255F	Aldrin	98.1%
	4,4'-DDT	39.0%
K40255FDL	4,4'-DDT	45.9%
K40256F	Aldrin	43.7%
	Heptachlor Epoxide	383.0%
	4,4'-DDT	49.5%
K40257F	Aldrin	75.0%
	4,4'-DDT	473.1%
K40276F	Aldrin	49.5%
	gamma-Chlordane	157.3%
	4,4'-DDT	478.0%

K40277F	Aldrin	54.1%
	gamma-Chlordane	158.4%
	4,4'-DDE	26.7%
	4,4'-DDT	406.2%
K40278F	Aldrin	46.4%
	Heptachlor Epoxide	27.7%
	gamma-Chlordane	164.0%
	4,4'-DDT	98.7%
K40279F	Aldrin	74.1%
	Heptachlor Epoxide	42.9%
	4,4'-DDE	28.0%
K40280F	Aldrin	113.5%
	gamma-Chlordane	227.8%
	4,4'-DDT	415.9%
K40281F	Aldrin	38.7%
	gamma-Chlordane	187.3%
	4,4'-DDT	169.8%
K40282F	Aldrin	94.4%
	gamma-Chlordane	189.7%
	trans-Nonachlor	321.8%
	4,4'-DDT	216.7%
K40288F	Aldrin	56.5%
	gamma-Chlordane	134.5%
	4,4'-DDT	281.3%
K40289F	Aldrin	55.9%
	4,4'-DDE	25.6%
K40290F	Aldrin	80.5%
	4,4'-DDE	29.0%
K40302F	Aldrin	50.8%
	gamma-Chlordane	110.2%
	4,4'-DDE	28.0%
	4,4'-DDT	532.5%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

## 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the specified control limit in both the matrix spike and matrix spike duplicate samples. The high recoveries can be attributed to positive interference from PCBs present in the matrix spike. All other recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. Matrix spike recoveries were with acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers have been added to the samples based on matrix spike performance.

## 8. General Comments

The recommended data usage for the sample dilutions is as follows:

### K40252F and K40252FDL

The data from sample K40252F should be used for all compounds except 4,4'-DDE. The data from the dilution K40252FDL should be used for 4,4'-DDE only.

### K40254F and K40254FDL

The data from sample K40254F should be used for all compounds except 4,4'-DDE. The data from the dilution K40254FDL should be used for 4,4'-DDE only.

### K40255F and K40255FDL

The data from sample K40255F should be used for all compounds except 4,4'-DDE and Aldrin. The data from the dilution K40255FDL should be used for 4,4'-DDE and Aldrin only.

## 9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>          </u>	<u>          </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>          </u>	<u>          </u>
Are the outliers correctly marked with an asterisk?	<u>          </u>	<u>          </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>          </u>	<u>X</u>	<u>          </u>
If yes, were the samples reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
Were the method blanks reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>          </u>	<u>          </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>          </u>	<u>          </u>
How many spike recoveries were outside of QC limits?			
<u>  2  </u> out of <u>  8  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>          </u>	<u>          </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>          </u>	<u>          </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>          </u>	<u>          </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any trip/field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u>      </u>	<u>      </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u>      </u>	<u>      </u>
Toxaphene multipoint calibration	<u>X</u>	<u>      </u>	<u>      </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u>      </u>	<u>      </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u>      </u>	<u>      </u>
instrument blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>	<u>      </u>	<u>      </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u>      </u>	<u>      </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u>      </u>	<u>      </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u>      </u>	<u>X</u>	<u>      </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>      </u>	<u>X</u>	<u>      </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are RPD values for all compounds < 25%?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			

# Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>      </u>	<u>      </u>
Are all samples listed on the form?	<u>X</u>	<u>      </u>	<u>      </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>      </u>	<u>      </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>      </u>	<u>      </u>
GPC calibration (80-110%)	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>      </u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>      </u>	<u>X</u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40248F	OK for all samples	OK	OK	OK	OK
K40249F					
K40252F					
K40252FDL					
K40253F					
K40254F					
K40254FDL					
K40291WMSD					
K40292W					
K40255F					
K40255FDL					
K40256F					
K40257F					
K40276F					
K40277F					
K40278F					
K40279F					
K40280F					
K40281F					
K40282F					
K40287F					
K40288F					
K40289F					
K40290F					
K40302F					
K40302FMS					
K40302FMSD					

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404  
 Column: RTX-5

Date:	5/17/94	5/18	5/19	5/19	5/19	5/20	5/24
Time:	17:19	15:56	00:16	08:36	16:57	01:18	09:01
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok	55.4
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							K40302F MSD
							MSB

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404  
 Column: RTX-5

Date:		5/25					
Time:		00:48					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl		ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404  
 Column: RTX-35

Date:	5/17/94	5/18	5/19	5/19	5/19	5/20	5/24
Time:	17:19	15:56	00:16	08:36	16:57	01:18	09:01
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok	ok
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							K40302F MSD
							MSB

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404  
 Column: RTX-35

Date:		5/25					
Time:		00:48					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl		ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**Corrected Sample Analysis Data Sheets**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40248F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216198  
Date Received: 10/12/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.018	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40249F

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216200  
Date Received: 10/12/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.022	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40252F

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216202  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/18/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0052	
39765-80-5	trans-Nonachlor	0.011	
72-55-9	4,4'-DDE	0.30 <del>0.17</del>	* DJ
60-57-1	Dieldrin	0.041	
72-54-8	4,4'-DDD	0.081	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.068	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40253F

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 4.0

Lab Sample ID: 216204  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/18/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.040	U
2113-57-7	3-Bromobiphenyl	0.040	U
92-66-0	4-Bromobiphenyl	0.040	U
118-74-1	Hexachlorobenzene	0.020	U
58-89-9	gamma-BHC	0.020	U
309-00-2	Aldrin	0.066	J
1024-57-3	Heptachlor Epoxide	0.056	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.024</del>	
5103-71-9	alpha-Chlordane	0.020	U
39765-80-5	trans-Nonachlor	0.020	U
72-55-9	4,4'-DDE	0.14	
60-57-1	Dieldrin	0.040	U
72-54-8	4,4'-DDD	0.040	U
5103-73-1	cis-Nonachlor	0.020	U
50-29-3	4,4'-DDT	0.040 <sup>as</sup>	U
36355-01-8	Hexabromobiphenyl	0.080	U
8001-35-2	Toxaphene	0.80	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40254F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216206  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0053	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0060	
39765-80-5	trans-Nonachlor	0.020	
72-55-9	4,4'-DDE	0.17 <del>0.30</del>	<del>X</del> DJ
60-57-1	Dieldrin	0.073	
72-54-8	4,4'-DDD	0.12	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.11	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40255F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 216208

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	<del>0.010 0.0053</del>	<del>U</del> D
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	<del>0.18 0.16</del>	<del>U</del> DJ
60-57-1	Dieldrin	0.011	
72-54-8	4,4'-DDD	0.037	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.042	J
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40256F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216210

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0071	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.0053</del>	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.076	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.020	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.020	J
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40257F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216212  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.010	JN
1024-57-3	Heptachlor Epoxide	0.0084	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.042	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.012	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40276F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216214

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.028	J
1024-57-3	Heptachlor Epoxide	0.024	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0080</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.051	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.014	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.015</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

5

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40277F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216216

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.029	JN
1024-57-3	Heptachlor Epoxide	0.025	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0089</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.013	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.013</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

K40278F

SDG: 40009

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 216218  
 Date Received: 10/13/93  
 Date Extracted: 04/10/94  
 Date Analyzed: 05/19/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.026	
1024-57-3	Heptachlor Epoxide	0.026	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0086</del>	
5103-71-9	alpha-Chlordane	0.0058	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.093	
60-57-1	Dieldrin	0.011	
72-54-8	4,4'-DDD	0.033	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.031</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40279F

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 40009Lab Sample ID: 216220Date Received: 10/13/93Date Extracted: 04/10/94Date Analyzed: 05/19/94Sulfur Clean-up: NPhase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	JN
1024-57-3	Heptachlor Epoxide	0.0098	J
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.018	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40280F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216222

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 3.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.030	U
2113-57-7	3-Bromobiphenyl	0.030	U
92-66-0	4-Bromobiphenyl	0.030	U
118-74-1	Hexachlorobenzene	0.015	U
58-89-9	gamma-BHC	0.015	U
<del>369-60-2</del>	<del>Aldrin</del>	<del>0.053</del>	
1024-57-3	Heptachlor Epoxide	0.078	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.025</del>	
5103-71-9	alpha-Chlordane	0.015	
39765-80-5	trans-Nonachlor	0.015	U
72-55-9	4,4'-DDE	0.16	
60-57-1	Dieldrin	0.030	U
72-54-8	4,4'-DDD	0.036	
5103-73-1	cis-Nonachlor	0.015	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.049</del>	
36355-01-8	Hexabromobiphenyl	0.060	U
8001-35-2	Toxaphene	0.60	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40281F

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216224  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.030	J
1024-57-3	Heptachlor Epoxide	0.027	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0071</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.039	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.023	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-28-3</del>	<del>4,4' DDT</del>	<del>0.013</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40282F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 2.0

Lab Sample ID: 216226  
Date Received: 10/13/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.020	U
2113-57-7	3-Bromobiphenyl	0.020	U
92-66-0	4-Bromobiphenyl	0.020	U
118-74-1	Hexachlorobenzene	0.010	U
58-89-9	gamma-BHC	0.010	U
309-00-2	Aldrin	0.028	
1024-57-3	Heptachlor Epoxide	0.027	
5103-74-2	gamma-Chlordane	0.011	
5103-71-9	alpha-Chlordane	0.010	U
30765-80-5	trans-Nonachlor	0.011	
72-55-9	4,4'-DDE	0.095	
60-57-1	Dieldrin	0.020	U
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.017	
50-29-3	4,4'-DDT	0.032	
36355-01-8	Hexabromobiphenyl	0.040	U
8001-35-2	Toxaphene	0.40	U

R  
R  
R  
R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40287F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216228

Date Received: 10/14/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40288F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216230

Date Received: 10/14/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.016	JN
1024-57-3	Heptachlor Epoxide	0.013	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0058</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.050	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.015</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40289F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216232  
Date Received: 10/14/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.014	JN
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.022	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050 *	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40290F

SDG: 40009

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 216234  
Date Received: 10/14/93  
Date Extracted: 04/10/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.017	JN
1024-57-3	Heptachlor Epoxide	0.018	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	✓
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40302F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40009

Lab Sample ID: 216236

Date Received: 10/14/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.026	JN
1024-57-3	Heptachlor Epoxide	0.023	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0088</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.042	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.011</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

**MERCURY ANALYSES**

### Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

#### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

#### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

#### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

### 4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

#### 4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

#### 5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

#### 6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

#### 7. Furnace QC

No furnace analyses were performed.

#### 8. Method of Standard Additions (MSA)

No MSA were performed.

#### 9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

## Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u>      </u>	<u>      </u>
Sample No.?	<u>X</u>	<u>      </u>	<u>      </u>
SDG No.?	<u>X</u>	<u>      </u>	<u>      </u>
Correct units?	<u>X</u>	<u>      </u>	<u>      </u>
Matrix?	<u>X</u>	<u>      </u>	<u>      </u>
<b>Raw Data</b>			
Is the digestion log for flame AA/ICP present?	<u>      </u>	<u>      </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u>      </u>	<u>      </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u>      </u>	<u>      </u>
Is the distillation log for cyanides present?	<u>      </u>	<u>      </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u>      </u>	<u>      </u>
Are the measurement read out records present for:			
ICP	<u>      </u>	<u>      </u>	<u>X</u>
Flame AA	<u>      </u>	<u>      </u>	<u>X</u>
Furnace AA	<u>      </u>	<u>      </u>	<u>X</u>
Mercury	<u>X</u>	<u>      </u>	<u>      </u>
Cyanides	<u>      </u>	<u>      </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u>      </u>	<u>      </u>
Is the data properly labeled?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u>      </u>	<u>      </u>

**Inorganic Data Validation Checklist - Page 2**

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?			X
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		X	
greater than 200%?		X	
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	X		

## Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	<u>X</u>	<u>      </u>	<u>      </u>
Was field blank used for duplicate analysis?	<u>      </u>	<u>X</u>	<u>      </u>
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	<u>X</u>	<u>      </u>	<u>      </u>
If no, are all results outside the control limits flagged with an * on Form I's and VI?	<u>      </u>	<u>      </u>	<u>X</u>
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?	<u>      </u>	<u>X</u>	<u>      </u>
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	<u>X</u>	<u>      </u>	<u>      </u>
each batch samples digested/distilled?	<u>X</u>	<u>      </u>	<u>      </u>
Is LLCS "Found" value higher than the control limits on Form VII?	<u>      </u>	<u>X</u>	<u>      </u>
Is LCS "Found" lower than the control limits on Form VII?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?	<u>      </u>	<u>      </u>	<u>X</u>
each matrix type?	<u>      </u>	<u>      </u>	<u>X</u>
Was field blank(s) used for Serial Dilution Analysis?	<u>      </u>	<u>      </u>	<u>X</u>
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	<u>      </u>	<u>      </u>	<u>X</u>
Are any % difference values:			
> 10%?	<u>      </u>	<u>      </u>	<u>X</u>
$\geq 100\%$ ?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	<u>      </u>	<u>      </u>	<u>X</u>

## Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	_____	_____	X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	_____	_____	X
Is analytical spike recovery outside the control limits (85-115%) for any sample?	_____	_____	X
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	_____	X	_____
If no, is any Form I result coded with "S" or a "+"?	_____	X	_____
Is coefficient of correlation for MSA less than 0.990 for any sample?	_____	_____	X
Was MSA required for any sample but not performed?	_____	X	_____
Is coefficient of correlation for MSA less than 0.995?	_____	_____	X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	_____	_____	X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	_____	_____	X
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	_____	_____	X
If no, was field blank value already rejected due to other QC criteria?	_____	_____	X
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	X	_____	_____
ICP Interelement Correlation Factors (annually)?	_____	_____	X
ICP Linear Ranges (quarterly)?	_____	_____	X
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	X	_____	_____
all the instruments used?	X	_____	_____

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	_____	<u>X</u>	_____
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	_____	_____	<u>X</u>
Was any sample result higher linear range of ICP.	_____	_____	<u>X</u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	_____	<u>X</u>	_____
If yes for any of the above, was the sample diluted to obtain the result on Form I?	_____	_____	<u>X</u>

**Corrected Sample Analysis Data Sheets**

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40248F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216198

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40249F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216200

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		YN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40252F

Lab Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40009

Matrix (soil/water): FISH

Lab Sample ID: 216202

Level (low/med): LOW

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.11		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40253F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216204

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.10	-	IN	CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40254F

LSD Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216206

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40255F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216208

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.28		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40256F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216210

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40257F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216212

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.28		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40276F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216214

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/13/93

\* Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.25		5N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40277F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216216

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40278F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216218

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		--		NR
7440-36-0	Antimony		--		NR
7440-38-2	Arsenic		--		NR
7440-39-3	Barium		--		NR
7440-41-7	Beryllium		--		NR
7440-43-9	Cadmium		--		NR
7440-70-2	Calcium		--		NR
7440-47-3	Chromium		--		NR
7440-48-4	Cobalt		--		NR
7440-50-8	Copper		--		NR
7439-89-6	Iron		--		NR
7439-92-1	Lead		--		NR
7439-95-4	Magnesium		--		NR
7439-96-5	Manganese		--		NR
7439-97-6	Mercury	0.27	--	JN	CV
7440-02-0	Nickel		--		NR
7440-09-7	Potassium		--		NR
7782-49-2	Selenium		--		NR
7440-22-4	Silver		--		NR
7440-23-5	Sodium		--		NR
7440-28-0	Thallium		--		NR
7440-62-2	Vanadium		--		NR
7440-66-6	Zinc		--		NR
	Cyanide		--		NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40279F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216220

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.19		✓	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40280F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216222

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.33		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40281F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216224

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.31		5N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.:

K40282F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 216226

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40287F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216228

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.33		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40288F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216230

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.15		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40289F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40009

Matrix (soil/water): FISH Lab Sample ID: 216232

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40290F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_  
Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_  
Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 216234  
Level (low/med): LOW \_\_\_\_\_ Date Received: 10/14/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.22		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_  
Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40302F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40009 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 216236

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.11		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## MISCELLANEOUS PARAMETERS

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Body
K40248	Small Mouth Bass	female	300g	1.46	3.84
K40249	Small Mouth Bass	female	185g	1.06	3.70
K40252	Small Mouth Bass	male	227g	1.42	5.40
K40253	Small Mouth Bass	female	247g	1.44	3.60
K40254	Small Mouth Bass	male	286g	3.08	5.60
K40255	Small Mouth Bass	male	331g	0.84	4.50
K40256	Small Mouth Bass	male	322g	0.81	5.10
K40257	Small Mouth Bass	male	161g	0.51	1.70
K40276	Small Mouth Bass	female	159g	0.50	2.20
K40277	Small Mouth Bass	male	204g	0.69	3.40
K40278	Small Mouth Bass	female	258g	1.34	4.70
K40279	Small Mouth Bass	female	225g	0.51	1.50
K40280	Small Mouth Bass	male	447g	1.92	4.10
K40281	Small Mouth Bass	female	302g	1.42	5.30
K40282	Small Mouth Bass	male	275g	1.05	3.80
K40287	Small Mouth Bass	male	273g	0.26	2.93
K40288	Small Mouth Bass	male	174g	0.56	3.28
K40289	Small Mouth Bass	female	144g	0.50	2.91
K40290	Small Mouth Bass	female	220g	0.74	3.93
K40302	Small Mouth Bass	male	180g	0.58	3.70



**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40118**

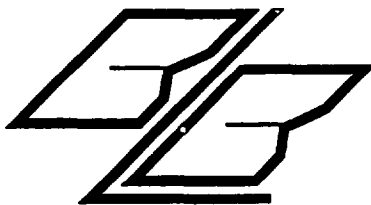
**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40118 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analyte	
					Pest/PCB/ Hg	%Lipid
K40264W	201022	Sucker	whole body	Otsego City Dam	x	x
K40265W	201023	Sucker	whole body	Otsego City Dam	x	x
K40266W	201024	Sucker	whole body	Otsego City Dam	x	x
K40267W	201025	Sucker	whole body	Otsego City Dam	x	x
K40291W*	201382	Sucker	whole body	Otsego Dam	x	x
K40292W	201383	Sucker	whole body	Otsego Dam	x	x
K40293W	201384	Sucker	whole body	Otsego Dam	x	x
K40294W	201385	Sucker	whole body	Otsego Dam	x	x
K40295W	201386	Sucker	whole body	Otsego Dam	x	x
K40296W	201387	Sucker	whole body	Otsego Dam	x	x
K40297W	201388	Sucker	whole body	Otsego Dam	x	x
K40298W	201389	Sucker	whole body	Otsego Dam	x	x
K40299W	201390	Sucker	whole body	Otsego Dam	x	x
K40300W	201391	Sucker	whole body	Otsego Dam	x	x
K40301W	201392	Sucker	whole body	Otsego Dam	x	x

\* MS/MSD/DUP performed on sample

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

**5. Surrogates / System Monitoring Compounds**

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K40291W and K40292W. All data for these samples have been qualified as estimated. All other surrogate recoveries were within acceptable control limits.

**6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

**7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All recoveries in the matrix spike blank were also within acceptable control limits.

**8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

**DATA REVIEW CHECKLIST**

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>          </u>	<u>          </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>          </u>	<u>          </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>          </u>	<u>          </u>
Were there any false negatives?	<u>          </u>	<u>X</u>	<u>          </u>
Was GC/MS confirmation provided when required?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>          </u>	<u>          </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>          </u>	<u>X</u>	<u>          </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40264W	OK for all samples				
K40265W					
K40266W					
K40267W					
K40291W		↓ (42)	↓ (54)	↓ (44)	↓ (56)
K40291WMS					
K40291WMSD					
K40292W		↓ (45)	↓ (56)	↓ (47)	↓ (58)
K40293W					
K40294W					
K40295W					
K40296W					
K40297W					
K40298W					
K40299W					
K40300W					
K40301W					

Surrogate Standards  
 TCX Tetrachloro-m-xylene  
 DCB Decachlorobiphenyl

Qualifiers:  
 D Surrogates diluted out  
 ↑ Recovery high  
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits. \*

## PCB Calibration Summary

Instrument: HP2618  
Column: RTX-35 / RTX-5

[illegible]

# PCB Calibration Summary - Page 2

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:		5/14	5/14				
Time:		0835	0908				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		4.0					
Aroclor 1254							
Aroclor 1260			0.5				
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40264W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201022

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.82	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.92	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40265W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201023

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.0	
11097-69-1	Aroclor-1254	0.81	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40266W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201024

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.30	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.39	
11096-82-5	Aroclor-1260	0.050	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40267W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201025

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.46	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.64	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40291W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201382

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U J
11104-28-2	Aroclor-1221	0.10	U J
11141-16-5	Aroclor-1232	0.10	U J
53469-21-9	Aroclor-1242	0.10	U J
12672-29-6	Aroclor-1248	0.90	J
11097-69-1	Aroclor-1254	0.56	J
11096-82-5	Aroclor-1260	0.10	U J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40292W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201383

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U J
11104-28-2	Aroclor-1221	0.10	U J
11141-16-5	Aroclor-1232	0.10	U J
53469-21-9	Aroclor-1242	0.10	U J
12672-29-6	Aroclor-1248	0.95	J
11097-69-1	Aroclor-1254	0.56	J
11096-82-5	Aroclor-1260	0.10	U J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40293W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201384

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 5.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.7	
11097-69-1	Aroclor-1254	0.87	
11096-82-5	Aroclor-1260	0.25	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40294W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201385

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	1.2	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.10	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40295W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201386

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.3	
11097-69-1	Aroclor-1254	0.75	
11096-82-5	Aroclor-1260	0.19	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40296W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201387

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.85	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40297W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201388

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/14/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.3	
11097-69-1	Aroclor-1254	0.83	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40298W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201389

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/14/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.87	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40299W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201390

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/14/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	1.1	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.10	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40300W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Phase Type: BIOTA

Lab Sample ID: 201391

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.86	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40301W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40118

**Phase Type:** BIOTA

**Lab Sample ID:** 201392

**Phase Weight:** 10.0 (g)

**Date Received:** 10/14/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/14/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.87	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Aroclor-1260	0.10	U

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in sample K40291W. All data for this sample have been qualified as estimated. All other surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40264W	gamma-Chlordane	125.0%
	trans-Nonachlor	351.5%
	4,4'-DDE	40.2%
	4,4'-DDT	311.8%
K40265W	Aldrin	37.4%
	gamma-Chlordane	120.4%
	4,4'-DDE	44.0%
	4,4'-DDD	31.8%
	4,4'-DDT	508.0%
K40266W	Aldrin	34.4%
	gamma-Chlordane	74.6%
	4,4'-DDE	36.4%
K40267W	gamma-Chlordane	114.7%
	4,4'-DDE	58.9%
K40291W	Aldrin	30.0%
	gamma-Chlordane	174.4%
	4,4'-DDE	39.5%
	Dieldrin	89.2%
	4,4'-DDT	383.3%
K40292W	gamma-Chlordane	155.4%
	4,4'-DDE	39.9%
	Dieldrin	60.6%
	4,4'-DDT	347.8%

K40293W	Aldrin	26.6%
	gamma-Chlordane	157.3%
	trans-Nonachlor	362.8%
	4,4'-DDE	29.7%
	Dieldrin	48.6%
	4,4'-DDT	308.5%
K40294W	Aldrin	29.2%
	gamma-Chlordane	148.7%
	trans-Nonachlor	325.0%
	4,4'-DDE	26.9%
	Dieldrin	56.4%
	4,4'-DDT	333.6%
K40295W	Aldrin	29.3%
	Heptachlor Epoxide	62.4%
	gamma-Chlordane	162.8%
	trans-Nonachlor	376.6%
	4,4'-DDE	33.2%
	Dieldrin	88.1%
	4,4'-DDT	414.9%
K40296W	Aldrin	33.3%
	Heptachlor Epoxide	74.1%
	gamma-Chlordane	169.6%
	4,4'-DDE	30.9%
	Dieldrin	89.9%
	4,4'-DDT	325.6%
K40297W	Aldrin	25.7%
	Heptachlor Epoxide	31.3%
	gamma-Chlordane	166.0%
	4,4'-DDE	32.8%
	Dieldrin	57.4%
	4,4'-DDT	319.5%
K40298W	Aldrin	33.7%
	Heptachlor Epoxide	46.3%
	gamma-Chlordane	145.3%
	4,4'-DDE	38.9%
	Dieldrin	404.4%
	4,4'-DDT	432.2%
K40299W	Aldrin	33.0%
	Heptachlor Epoxide	345.1%
	gamma-Chlordane	144.1%
	4,4'-DDE	34.4%
	4,4'-DDT	409.3%

K40300W	Aldrin	42.5%
	Heptachlor Epoxide	29.3%
	gamma-Chlordane	139.9%
	trans-Nonachlor	369.4%
	4,4'-DDT	356.8%
K40301W	Aldrin	38.8%
	Heptachlor Epoxide	97.1%
	gamma-Chlordane	171.7%
	4,4'-DDE	30.2%
	4,4'-DDT	420.3%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

#### 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the acceptable control limit in the matrix spike and matrix spike duplicate samples. Recoveries of Dieldrin and 4,4'-DDT were also slightly above the control limit. The high recoveries can be attributed to positive interference from the sample matrix. Recoveries were within acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers were added to the samples based on matrix spike performance.

#### 8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?		X	
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Were the method blanks reanalyzed?			X
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
<u>5</u> out of <u>8</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>4</u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	X		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>		
Do any method/reagent/instrument blanks have positive results?		<u>X</u>	
Do any trip/field/rinse blanks have positive results?			<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?		<u>X</u>	
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>		
performance evaluation mixtures (BCS)	<u>X</u>		
Toxaphene multipoint calibration	<u>X</u>		
Pesticide/PBB multipoint calibration	<u>X</u>		
Pesticide/PBB mid-point standard	<u>X</u>		
instrument blanks	<u>X</u>		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>		
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		<u>X</u>	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>X</u>		
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>		
Are RPD values for all compounds < 25%?	<u>X</u>		
<b><u>Analytical Sequence Check</u></b>			
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>          </u>	<u>          </u>
Are all samples listed on the form?	<u>X</u>	<u>          </u>	<u>          </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>          </u>	<u>          </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>          </u>	<u>          </u>
GPC calibration (80-110%)	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>          </u>	<u>          </u>
Was GC/MS confirmation provided when required?	<u>          </u>	<u>          </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>          </u>	<u>X</u>	<u>          </u>
Were there any false negatives?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>          </u>	<u>          </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>          </u>	<u>X</u>	<u>          </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K4026	ok for all samples				
K402654W					
K402664W					
K402674W					
K40291W					
K40291W		↓ (53)	↓ (52)	↓ (50)	↓ (51)
K40291WMS					
K40291WMSD					
K40292W					
K40293W					
K40294W					
K40295W					
K40296W					
K40297W					
K40298W					
K40299W					
K40300W					
K40301W					

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	5/17/94	5/23	5/23	5/24	5/24		
Time:	17:19	05:11	16:22	00:41	09:01		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	OK	OK		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404  
 Column: RTX-35

Date:	5/17/94	5/23	5/23	5/24	5/24		
Time:	17:19	05:11	16:22	00:41	09:01		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**Corrected Sample Analysis Data Sheets**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40264W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201022  
Date Received: 10/13/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.038	
1024-57-3	Heptachlor Epoxide	0.032	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0068</del>	
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.017	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40265W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201023  
Date Received: 10/13/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.034	J
1024-57-3	Heptachlor Epoxide	0.026	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.011</del>	
5103-71-9	alpha-Chlordane	0.0058	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.030	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	J
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.011</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40266W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201024  
Date Received: 10/13/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	J
1024-57-3	Heptachlor Epoxide	0.012	
5103-74-2	gamma-Chlordane	0.0059	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

K40267W

SDG: 40118

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201025  
 Date Received: 10/13/93  
 Date Extracted: 04/14/94  
 Date Analyzed: 05/23/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.023	
1024-57-3	Heptachlor Epoxide	0.019	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0075</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.020	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050*	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">K40291W</div> SDG: <u>40118</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Lab Sample ID: <u>201382</u> Date Received: <u>10/14/93</u> Date Extracted: <u>04/14/94</u> Date Analyzed: <u>05/23/94</u> Sulfur Clean-up: <u>N</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.037	UJ
1024-57-3	Heptachlor Epoxide	0.032	UJ
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0090</del>	
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.030	UJ
60-57-1	Dieldrin	0.012	UJ
72-54-8	4,4'-DDD	0.010	UJ
5103-73-1	cis-Nonachlor	0.0050	UJ
<del>50-28-3</del>	<del>4,4' DDT</del>	<del>0.011</del>	
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 5px auto;">K40292W</div> SDG: <u>40118</u>  Lab Sample ID: <u>201383</u> Date Received: <u>10/14/93</u> Date Extracted: <u>04/14/94</u> Date Analyzed: <u>05/23/94</u> Sulfur Clean-up: <u>N</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.047	
1024-57-3	Heptachlor Epoxide	0.044	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.045	J
60-57-1	Dieldrin	0.013	JN
72-54-8	4,4'-DDD	0.019	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.016</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40264W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Lab Sample ID: 201022

Date Received: 10/13/93

Date Extracted: 04/14/94

Date Analyzed: 05/23/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.038	
1024-57-3	Heptachlor Epoxide	0.032	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0068</del>	
72-55-9	4,4'-DDE	0.043	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.017	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40265W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201023  
Date Received: 10/13/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.034	J
1024-57-3	Heptachlor Epoxide	0.026	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.011</del>	
5103-71-9	alpha-Chlordane	0.0058	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.030	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	J
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.011</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40266W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201024  
Date Received: 10/13/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	U
1024-57-3	Heptachlor Epoxide	0.012	U
5103-74-2	gamma-Chlordane	0.0059	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40267W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40118

Lab Sample ID: 201025

Date Received: 10/13/93

Date Extracted: 04/14/94

Date Analyzed: 05/23/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.023	
1024-57-3	Heptachlor Epoxide	0.019	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0075</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.020	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050*	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40291W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201382  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.037	UJ
1024-57-3	Heptachlor Epoxide	0.032	UJ
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0090</del>	<del>UJ</del>
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.030	UJ
60-57-1	Dieldrin	0.012	UJ
72-54-8	4,4'-DDD	0.010	UJ
5103-73-1	cis-Nonachlor	0.0050	UJ
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.011</del>	<del>UJ</del>
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 5px auto;">K40292W</div> SDG: <u>40118</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Lab Sample ID: <u>201383</u> Date Received: <u>10/14/93</u> Date Extracted: <u>04/14/94</u> Date Analyzed: <u>05/23/94</u> Sulfur Clean-up: <u>N</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.047	
1024-57-3	Heptachlor Epoxide	0.044	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.045	J
60-57-1	Dieldrin	0.013	JN
72-54-8	4,4'-DDD	0.019	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.016</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40293W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201384  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.054	J
1024-57-3	Heptachlor Epoxide	0.046	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.015</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0086</del>	
72-55-9	4,4'-DDE	0.064	J
60-57-1	Dieldrin	0.017	J
72-54-8	4,4'-DDD	0.027	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.024</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40294W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201385  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/23/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.053	J
1024-57-3	Heptachlor Epoxide	0.044	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.016</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0096</del>	
72-55-9	4,4'-DDE	0.070	J
60-57-1	Dieldrin	0.017	JN
72-54-8	4,4'-DDD	0.030	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-2</del>	<del>4,4'-DDT</del>	<del>0.023</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40295W

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40118

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201386  
 Date Received: 10/14/93  
 Date Extracted: 04/14/94  
 Date Analyzed: 05/23/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.050	J
1024-57-3	Heptachlor Epoxide	0.045	JN
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.014</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0077</del>	
72-55-9	4,4'-DDE	0.056	J
60-57-1	Dieldrin	0.013	JN
72-54-8	4,4'-DDD	0.022	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.018</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>  Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">             Client ID No.  <b>K40296W</b> </div> SDG: <u>40118</u>  Lab Sample ID: <u>201387</u> Date Received: <u>10/14/93</u> Date Extracted: <u>04/14/94</u> Date Analyzed: <u>05/23/94</u> Sulfur Clean-up: <u>N</u>
--	--

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.045	J
1024-57-3	Heptachlor Epoxide	0.042	JN
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.013</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.056	J
60-57-1	Dieldrin	0.012	JN
72-54-8	4,4'-DDD	0.021 <sub>a</sub>	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.018</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40297W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201388  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.053	J
1024-57-3	Heptachlor Epoxide	0.048	J
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.014</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.059	J
60-57-1	Dieldrin	0.015	JN
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.020</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40298W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201389  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.053	J
1024-57-3	Heptachlor Epoxide	0.048	J
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.016</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.055	J
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.014</del>	
72-54-8	4,4'-DDD	0.021	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.018</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

<p>Lab Name: <u>Aquatec, Inc.</u></p> <p>Lab Code: <u>AQUAI</u></p> <p>Contract: <u>91082</u></p> <p>Case: <u>BIO</u></p> <p>Phase Type: <u>Biota</u></p> <p>Phase Weight: <u>10.0 g</u></p> <p>Extraction: <u>Soxhlet</u></p> <p>Dilution Factor: <u>1.0</u></p>	<p style="text-align: right;">Client ID No.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">K40299W</div> <p>SDG: <u>40118</u></p> <p>Lab Sample ID: <u>201390</u></p> <p>Date Received: <u>10/14/93</u></p> <p>Date Extracted: <u>04/14/94</u></p> <p>Date Analyzed: <u>05/24/94</u></p> <p>Sulfur Clean-up: <u>N</u></p>
--	--

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.055	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.057</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.017</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.066	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.020	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.023</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40300W

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201391  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.045	U
1024-57-3	Heptachlor Epoxide	0.044	U
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.015</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0085</del>	
72-55-9	4,4'-DDE	0.069	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.026	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.021</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40301W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40118

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201392  
Date Received: 10/14/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.058	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.058</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.018</del>	
5103-71-9	alpha-Chlordane	0.0093	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.080	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.024	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-2</del>	<del>4,4' DDT</del>	<del>0.027</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

RP

R

## MERCURY ANALYSES

## Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

### 4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

#### **4.2 Laboratory Duplicate**

The difference between laboratory duplicates was within acceptable limits.

#### **5. Laboratory Control Sample (LCS)**

All recoveries were within the acceptable recovery limits.

#### **6. Serial Dilution**

No ICP analyses were performed, therefore no serial dilution was necessary.

#### **7. Furnace QC**

No furnace analyses were performed.

#### **8. Method of Standard Additions (MSA)**

No MSA were performed.

#### **9. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u>          </u>	<u>          </u>
Sample No.?	<u>X</u>	<u>          </u>	<u>          </u>
SDG No.?	<u>X</u>	<u>          </u>	<u>          </u>
Correct units?	<u>X</u>	<u>          </u>	<u>          </u>
Matrix?	<u>X</u>	<u>          </u>	<u>          </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u>          </u>	<u>          </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u>          </u>	<u>          </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u>          </u>	<u>          </u>
Is the distillation log for cyanides present?	<u>          </u>	<u>          </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u>          </u>	<u>          </u>
Are the measurement read out records present for:			
ICP	<u>          </u>	<u>          </u>	<u>X</u>
Flame AA	<u>          </u>	<u>          </u>	<u>X</u>
Furnace AA	<u>          </u>	<u>          </u>	<u>X</u>
Mercury	<u>X</u>	<u>          </u>	<u>          </u>
Cyanides	<u>          </u>	<u>          </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u>          </u>	<u>          </u>
Is the data properly labeled?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u>          </u>	<u>          </u>

# Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
$\geq$ 100%?			X
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher linear range of ICP.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u>          </u>	<u>          </u>	<u>  X  </u>

**Corrected Sample Analysis Data Sheets**

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40264W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201022

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40265W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201023

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40266W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201024

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40267W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201025

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.02	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40291W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_  
Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_  
Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201382  
Level (low/med): LOW \_\_\_\_\_ Date Received: 10/14/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_  
Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40292W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201383

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40293W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201384

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40294W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201385

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40295W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH

Lab Sample ID: 201386

Level (low/med): LOW

Date Received: 10/14/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40296W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH Lab Sample ID: 201387

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40297W

Lab Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40118

Matrix (soil/water): FISH

Lab Sample ID: 201388

Level (low/med): LOW

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40298W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_  
Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_  
Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201389  
Level (low/med): LOW \_\_\_\_\_ Date Received: 10/14/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40299W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40118

Matrix (soil/water): FISH

Lab Sample ID: 201390

Level (low/med): LOW

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40300W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201391

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40301W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40118 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 201392

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## MISCELLANEOUS PARAMETERS

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40264W	Otsego City Dam - Golden Redhorse Sucker	female	2.52
K40265W	Otsego City Dam - Golden Redhorse Sucker	female	2.36
K40266W	Otsego City Dam - Golden Redhorse Sucker	male	1.01
K40267W	Otsego City Dam - Golden Redhorse Sucker	male	1.96
K40291W	Otsego City Dam - Golden Redhorse Sucker	male	3.39
K40292W	Otsego City Dam - Golden Redhorse Sucker	female	2.22
K40293W	Otsego City Dam - Golden Redhorse Sucker	male	3.80
K40294W	Otsego City Dam - Golden Redhorse Sucker	male	4.12
K40295W	Otsego City Dam - Golden Redhorse Sucker	female	2.66
K40296W	Otsego City Dam - Golden Redhorse Sucker	male	2.38
K40297W	Otsego City Dam - Golden Redhorse Sucker	male	3.21
K40298W	Otsego City Dam - Golden Redhorse Sucker	male	2.91
K40299W	Otsego City Dam - Golden Redhorse Sucker	male	3.15
K40300W	Otsego City Dam - Golden Redhorse Sucker	female	3.25
K40301W	Otsego City Dam - Golden Redhorse Sucker	male	2.61

**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40139**

**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40139 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/Hg	%Lipid
K40268F	215570	carp	fillet	Otsego Dam	x	x
K40268R	215571	carp	carcass	Otsego Dam		x
K40269F	215572	carp	fillet	Otsego Dam	x	x
K40269R	215573	carp	carcass	Otsego Dam		x
K40270F	215574	carp	fillet	Otsego Dam	x	x
K40270R	215575	carp	carcass	Otsego Dam		x
K40271F	215576	carp	fillet	Otsego Dam	x	x
K40271R	215577	carp	carcass	Otsego Dam		x
K40272F	215578	carp	fillet	Otsego Dam	x	x
K40272R	215579	carp	carcass	Otsego Dam		x
K40273F	215580	carp	fillet	Otsego Dam	x	x
K40273R	215581	carp	carcass	Otsego Dam		x
K40274F	215582	carp	fillet	Otsego Dam	x	x
K40274R	215583	carp	carcass	Otsego Dam		x
K40275F	215584	carp	fillet	Otsego Dam	x	x
K40275R	215585	carp	carcass	Otsego Dam		x
K40284F	215622	carp	fillet	Otsego Dam	x	x
K40284R	215623	carp	carcass	Otsego Dam		x
K40285F	215586	carp	fillet	Otsego Dam	x	x
K40285R	215587	carp	carcass	Otsego Dam		x
K40286F	215588	carp	fillet	Otsego Dam	x	x
K40286R	215589	carp	carcass	Otsego Dam		x
K40315F	215590	carp	fillet	Trowbridge	x	x
K40315R	215591	carp	carcass	Trowbridge		x
K40316F	215592	carp	fillet	Trowbridge	x	x
K40316R	215593	carp	carcass	Trowbridge		x
K40317F	215594	carp	fillet	Trowbridge	x	x
K40317R	215595	carp	carcass	Trowbridge		x

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40322F	215604	carp	fillet	Trowbridge	x	x
K40322R	215605	carp	carcass	Trowbridge		x
K40325F*	215606	carp	fillet	Trowbridge	x	x
K40325R	215607	carp	carcass	Trowbridge		x

\* MS/MSD/DUP performed on sample

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time with the exception of sample K40284F. All data for this sample have been qualified as estimated.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

### 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40271F, K40273F, K40275F, K40285F, K40316F K40325FMS, and K40325FMSD. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

## **6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

## **7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

## **8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40268F					
K40269F					
K40270F					
K40271F		↓ (57)		↓ (57)	
K40272F					
K40273F		↓ (51)		↓ (58)	
K40274F					
K40275F		↓ (59)			
K40284F	+2				
K40285F		↓ (59)		↓ (59)	
K40286F					
K40315F					
K40316F		↓ (59)		↓ (59)	
K40317F					
K40322F					
K40325F					
K40325FMS		↓ (52)			
K40325FMSD		↓ (47)		↓ (53)	

## Surrogate Standards

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

## Qualifiers:

D Surrogates diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:	4/30/94 0543	5/6	5/6	5/7	5/7	5/7	5/7
Time:	to 5/1/94 0106	1401	1435	0044	0119	0809	0843
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.2 / 4.4						3.0
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4						
Aroclor 1248	3.4 / 3.0	0.5		3.0		3.0	
Aroclor 1254	3.1 / 3.6		0.5				
Aroclor 1260	3.8 / 3.4				6.0		
Tetrachloro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
Affected Samples:							

# PCB Calibration Summary - Page 2

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:		5/7	5/7	5/10	5/10	5/10	5/10
Time:		1534	1608	0423	0457	1147	1221
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016					0.5		
Aroclor 1221							
Aroclor 1232							
Aroclor 1242			2.0				6.0
Aroclor 1248		2.0		5.0		6.5	
Aroclor 1254							
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

# PCB Calibration Summary - Page 3

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:	5/10/94 1845	5/16	5/16	5/16	5/16		
Time:	to 5/11/94 1334	1430	1503	2122	2155		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.6 / 4.6				7.0		
Aroclor 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						
Aroclor 1242	2.7 / 2.8						
Aroclor 1248	3.2 / 2.7	2.0		1.0			
Aroclor 1254	2.8 / 2.8						
Aroclor 1260	3.5 / 2.7		1.5				
Tetrachloro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							

# PCB Calibration Summary - Page 4

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:	5/18/94 1800	5/19	5/19	5/19	5/19		
Time:	to 5/19/94 1254	1807	1840	2320	2353		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	3.9 / 4.3		11.0				
Aroclor 1221	4.6 / 5.5						
Aroclor 1232	2.9 / 3.2						
Aroclor 1242	3.6 / 3.3				1.5		
Aroclor 1248	3.1 / 3.0	1.5		0.5			
Aroclor 1254	3.0 / 3.0						
Aroclor 1260	3.2 / 2.3						
Tetrachloro-m-xylene	5.0 / 7.7						
Decachlorobiphenyl	8.8 / 7.2						
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40268F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215570

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 1.0

Date Analyzed: 05/06/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.56	
11097-69-1	Aroclor-1254	0.30	
11096-82-5	Aroclor-1260	0.13	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40269F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215572

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/06/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.76	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.8	
11096-82-5	Aroclor-1260	0.28	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40270F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40139

**Phase Type:** BIOTA

**Lab Sample ID:** 215574

**Phase Weight:** 10.0 (g)

**Date Received:** 10/13/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/07/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/07/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.48	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.23	
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40271F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215576

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 2.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.1	
11097-69-1	Aroclor-1254	0.83	
11096-82-5	Aroclor-1260	0.10	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40272F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215578

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 1.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.53	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.62	
11096-82-5	Aroclor-1260	0.050	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40273F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215580

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.0	U
11097-69-1	Aroclor-1254	0.37	
11096-82-5	Aroclor-1260	0.19	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40274F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215582

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	2.2	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.7	
11096-82-5	Aroclor-1260	0.25	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40275F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215584

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	1.2	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.25	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40284F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215622

Phase Weight: 10.0 (g)

Date Received: 10/13/94

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	UJ
11104-28-2	Aroclor-1221	0.25	UJ
11141-16-5	Aroclor-1232	0.25	UJ
53469-21-9	Aroclor-1242	0.25	UJ
12672-29-6	Aroclor-1248	3.0	J
11097-69-1	Aroclor-1254	2.4	J
11096-82-5	Aroclor-1260	0.25	UJ

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40285F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215586

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.92	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.0	
11096-82-5	Aroclor-1260	0.22	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40286F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215588

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	3.0	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	3.4	
11096-82-5	Aroclor-1260	0.25	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40315F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215590

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	0.89	
11096-82-5	Aroclor-1260	0.22	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40316F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215592

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.9	
11096-82-5	Aroclor-1260	0.23	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40317F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215594

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.34	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.81	
11096-82-5	Aroclor-1260	0.16	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40322F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40139

Phase Type: BIOTA

Lab Sample ID: 215604

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/07/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.71	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40325F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40139

**Phase Type:** BIOTA

**Lab Sample ID:** 215606

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/07/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/16/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.4	
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.36	

**PESTICIDE ANALYSES**

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding time. Samples K40270FRE, K40271FRE, K40272FRE, K40284FRE, K40322FRE and K40325FRE, were reanalyzed over the specified holding time. All data for the reanalyses have been qualified as estimated due to the deviation.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were above the acceptable control limits for both surrogates in samples K40270F, K40272F and K40322F. All detected compounds in these samples have been qualified as estimated due to the deviation. All other surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40268F	Aldrin	40.9%
	gamma-Chlordane	81.8%
	4,4'-DDE	25.8%
	cis-Nonachlor	40.4%
K40269F	Aldrin	55.6%
	Heptachlor Epoxide	33.3%
	gamma-Chlordane	77.8%
	trans-Nonachlor	349.4%
	Dieldrin	181.8%
	4,4'-DDT	782.4%
K40270F	alpha-Chlordane	35.0%
	cis-Nonachlor	38.5%
	4,4'-DDT	181.3%
K40270FRE	alpha-Chlordane	25.3%
	trans-Nonachlor	30.0%
	cis-Nonachlor	75.9%
	4,4'-DDT	75.0%
K40271F	Aldrin	37.6%
	gamma-Chlordane	104.0%
	trans-Nonachlor	168.8%
	4,4'-DDE	123.8%
	Dieldrin	178.6%
	cis-Nonachlor	33.3%
	4,4'-DDT	615.8%

K40271FRE	Aldrin	35.6%
	gamma-Chlordane	92.3%
	alpha-Chlordane	34.4%
	trans-Nonachlor	202.6%
	4,4'-DDE	27.1%
	cis-Nonachlor	73.9%
	4,4'-DDT	650.0%
K40272F	Aldrin	54.0%
	Heptachlor Epoxide	102.9%
	gamma-Chlordane	88.9%
	trans-Nonachlor	276.5%
	Dieldrin	136.4%
	cis-Nonachlor	50.0%
	4,4'-DDT	653.8%
K40272FRE	Aldrin	53.6%
	Heptachlor Epoxide	107.1%
	gamma-Chlordane	79.5%
	4,4'-DDE	29.0%
	Dieldrin	110.5%
K40273F	Aldrin	31.0%
	gamma-Chlordane	133.3%
	alpha-Chlordane	52.0%
	trans-Nonachlor	262.1%
	4,4'-DDE	41.0%
	cis-Nonachlor	52.8%
K40274F	gamma-Chlordane	104.8%
	alpha-Chlordane	36.8%
	trans-Nonachlor	280.0%
	Dieldrin	120.0%
	4,4'-DDT	500.0%
K40275F	Aldrin	31.6%
	gamma-Chlordane	88.9%
	trans-Nonachlor	178.6%
	Dieldrin	141.7%
	4,4'-DDT	494.1%
K40284F	Aldrin	36.0%
	gamma-Chlordane	106.8%
	trans-Nonachlor	171.4%
	Dieldrin	151.8%
	cis-Nonachlor	33.3%
	4,4'-DDT	502.7%

K40284FRE	Aldrin	35.9%
	gamma-Chlordane	102.9%
	trans-Nonachlor	247.4%
	Dieldrin	100.0%
	cis-Nonachlor	29.2%
	4,4'-DDT	512.9%
K40285F	Aldrin	38.6%
	gamma-Chlordane	88.9%
	trans-Nonachlor	218.2%
	Dieldrin	183.3%
	cis-Nonachlor	100.0%
	4,4'-DDT	665.0%
K40286F	Aldrin	28.6%
	gamma-Chlordane	94.4%
	trans-Nonachlor	184.0%
	Dieldrin	136.0%
	4,4'-DDT	454.5%
K40315F	Aldrin	28.8%
	Heptachlor Epoxide	34.6%
	gamma-Chlordane	88.2%
	alpha-Chlordane	35.8%
	trans-Nonachlor	233.3%
	4,4'-DDE	28.6%
	Dieldrin	163.6%
	4,4'-DDT	682.6%
K40316F	Aldrin	62.7%
	gamma-Chlordane	66.7%
	trans-Nonachlor	353.1%
	4,4'-DDD	27.3%
	cis-Nonachlor	108.3%
	4,4'-DDT	718.8%
K40317F	Aldrin	41.2%
	gamma-Chlordane	80.9%
	cis-Nonachlor	70.7%
K40322F	Aldrin	44.0%
	gamma-Chlordane	96.2%
	trans-Nonachlor	264.3%
	4,4'-DDE	131.1%
	Dieldrin	180.0%
	4,4'-DDT	619.0%
K40322FRE	Aldrin	42.2%
	gamma-Chlordane	86.7%
	trans-Nonachlor	338.4%
	cis-Nonachlor	38.5%
	4,4'-DDT	607.7%

K40325F	Heptachlor Epoxide	31.9%
	gamma-Chlordane	139.1%
	trans-Nonachlor	300.0%
	4,4'-DDE	39.7%
	cis-Nonachlor	47.4%
	4,4'-DDT	715.9%
K40325FRE	gamma-Chlordane	125.0%
	alpha-Chlordane	242.1%
	4,4'-DDE	50.0%
	Dieldrin	163.6%
	4,4'-DDT	682.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

#### 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the acceptable control limit in the matrix spike and matrix spike duplicate samples. The high recovery can be attributed to positive interference from PCBs present in the matrix spike. All other recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. Matrix spike recoveries were with acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers were added to the samples based on matrix spike performance.

#### 8. General Comments

Elevated surrogate recoveries in the initial analyses of samples K40270F, K40271F, K40272F, K40284F, K40322F and K40325F suggested possible sample extract evaporation. The reanalyses of the archived aliquot had acceptable surrogate recoveries. The data from the reanalyses of these samples should be used for all compounds.

#### 9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>          </u>	<u>          </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>          </u>	<u>          </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>          </u>	<u>          </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>          </u>	<u>          </u>
If yes, were the samples reanalyzed?	<u>X</u>	<u>          </u>	<u>          </u>
Were the method blanks reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>          </u>	<u>          </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>          </u>	<u>          </u>
How many spike recoveries were outside of QC limits?			
<u>  2  </u> out of <u>  8  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>          </u>	<u>          </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>          </u>	<u>          </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>          </u>	<u>          </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>  X  </u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>  X  </u>	<u>      </u>
Do any trip/field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>  X  </u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>  X  </u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>  X  </u>	<u>      </u>	<u>      </u>
performance evaluation mixtures (BCS)	<u>  X  </u>	<u>      </u>	<u>      </u>
Toxaphene multipoint calibration	<u>  X  </u>	<u>      </u>	<u>      </u>
Pesticide/PBB multipoint calibration	<u>  X  </u>	<u>      </u>	<u>      </u>
Pesticide/PBB mid-point standard	<u>  X  </u>	<u>      </u>	<u>      </u>
instrument blanks	<u>  X  </u>	<u>      </u>	<u>      </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>  X  </u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>  X  </u>	<u>      </u>	<u>      </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>  X  </u>	<u>      </u>	<u>      </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>  X  </u>	<u>      </u>	<u>      </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u>      </u>	<u>  X  </u>	<u>      </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>  X  </u>	<u>      </u>	<u>      </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>  X  </u>	<u>      </u>	<u>      </u>
Are RPD values for all compounds < 25%?	<u>  X  </u>	<u>      </u>	<u>      </u>

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
<b><u>Analytical Sequence Check</u></b>			
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u>          </u>	<u>          </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>          </u>	<u>          </u>
Are all samples listed on the form?	<u>X</u>	<u>          </u>	<u>          </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>          </u>	<u>          </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>          </u>	<u>          </u>
GPC calibration (80-110%)	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>          </u>	<u>          </u>
Was GC/MS confirmation provided when required?	<u>          </u>	<u>          </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>          </u>	<u>X</u>	<u>          </u>
Were there any false negatives?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>          </u>	<u>          </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>          </u>	<u>X</u>	<u>          </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40268F					
K40269F					
K40270F		↑ (211)	↑ (189)	↑ (222)	↑ (185)
K40270FRE	+7				
K40271F					
K40271FRE	+7				
K40272F		↑ (191)	↑ (172)	↑ (198)	↑ (171)
K40272FRE	+7				
K40273F					
K40274F					
K40275F					
K40284F					
K40284FRE	+8				
K40285F					
K40286F					
K40315F					
K40316F					
K40317F					
K40322F		↑ (157)	↑ (158)	↑ (161)	↑ (153)
K40322FRE	+7				
K40325F					
K40325FRE	+8				
K40325FMSRE	+8				
K40325FMSDRE	+8				

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404  
 Column: RTX-5

Date:	5/6/94	5/10	5/10	5/10			
Time:	17:57	02:55	11:15	20:58			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404  
 Column: RTX-35

Date:	5/6/94	5/10	5/10	5/10			
Time:	17:57	02:55	11:15	20:58			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene					6.		
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404  
 Column: RTX-5

Date:	5/12/94	5/13					
Time:	17:54	08:10					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404  
 Column: RTX-35

Date:	5/12/94	5/13					
Time:	17:57	08:10					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 5

Instrument: HP2404

Column: RTX-5

Date:	5/17/94	5/24	5/25	5/25			
Time:	17:19	09:01	00:48	08:33			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 6

Instrument: HP2404  
 Column: RTX-35

Date:	5/17/84	5/24	5/25	5/25			
Time:	17:19	09:01	00:48	08:33			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**Corrected Sample Analysis Data Sheets**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40268F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215570  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	J
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0066	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.031	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0057	J
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40269F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215572  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.054	JN
1024-57-3	Heptachlor Epoxide	0.021	J
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.0079	
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0089</del>	
72-55-9	4,4'-DDE	0.11	
60-57-1	Dieldrin	0.011	
72-54-8	4,4'-DDD	0.037	
5103-73-1	cis-Nonachlor	0.021	
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40270FRE

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40139

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 215574R1  
 Date Received: 10/13/93  
 Date Extracted: 04/07/94  
 Date Analyzed: 05/24/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.014	J
1024-57-3	Heptachlor Epoxide	0.013	J
5103-74-2	gamma-Chlordane	0.0086	J
5103-71-9	alpha-Chlordane	0.0079	J
39765-80-5	trans-Nonachlor	0.010	J
72-55-9	4,4'-DDE	0.085	J
60-57-1	Dieldrin	0.010	J
72-54-8	4,4'-DDD	0.025	J
5103-73-1	cis-Nonachlor	0.0054	J
50-29-3	4,4'-DDT	0.012	J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40271FBE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215576R1  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.045	J
1024-57-3	Heptachlor Epoxide	0.023	J
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.013</del>	
5103-71-9	alpha-Chlordane	0.0064	J
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0076</del>	
72-55-9	4,4'-DDE	0.059	J
60-57-1	Dieldrin	0.010	UJ
72-54-8	4,4'-DDD	0.027	J
5103-73-1	cis-Nonachlor	0.0069	JN
<del>50-28-3</del>	<del>4,4' DDT</del>	<del>0.010</del>	
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40272FRE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215578R1  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.028	JN
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.014</del>	
5103-74-2	gamma-Chlordane	0.0078	JN
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.031	J
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.010</del>	U
72-54-8	4,4'-DDD	0.013	J
5103-73-1	cis-Nonachlor	0.0050	UJ
50-29-3	4,4'-DDT	0.010	UJ
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40273F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215580  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.058	J
1024-57-3	Heptachlor Epoxide	0.035	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0050	JN
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0058</del>	
72-55-9	4,4'-DDE	0.039	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.017	
5103-73-1	cis-Nonachlor	0.0072	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40274F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215582  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.072	
1024-57-3	Heptachlor Epoxide	0.048	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.021</del>	
5103-71-9	alpha-Chlordane	0.0095	J
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.010</del>	
72-55-9	4,4'-DDE	0.099	
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.015</del>	
72-54-8	4,4'-DDD	0.036	
5103-73-1	cis-Nonachlor	0.018	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.010</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R  
R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40275F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215584  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.057	J
1024-57-3	Heptachlor Epoxide	0.034	
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.011	
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.014</del>	
72-55-9	4,4'-DDE	0.10	
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.012</del>	
72-54-8	4,4'-DDD	0.036	
5103-73-1	cis-Nonachlor	0.018	
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40284FBE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 2.0

Lab Sample ID: 215622R1  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/25/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.020	U J
2113-57-7	3-Bromobiphenyl	0.020	U J
92-66-0	4-Bromobiphenyl	0.020	U J
118-74-1	Hexachlorobenzene	0.010	U J
58-89-9	gamma-BHC	0.010	U J
309-00-2	Aldrin	0.12	J
1024-57-3	Heptachlor Epoxide	0.069	J
5103-74-2	gamma-Chlordane	0.034	J
5103-71-9	alpha-Chlordane	0.017	J
30765-80-5	trans-Nonachlor	0.019	J
72-55-9	4,4'-DDE	0.16	J
60-57-1	Dieldrin	0.025	J
72-54-8	4,4'-DDD	0.052	J
5103-73-1	cis-Nonachlor	0.024	J
50-28-3	4,4'-DDT	0.031	J
36355-01-8	Hexabromobiphenyl	0.040	U J
8001-35-2	Toxaphene	0.40	U J

R

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40285F

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215586  
Date Received: 10/14/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.057	J
1024-57-3	Heptachlor Epoxide	0.030	
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.0095	
<del>39765-80-5</del>	<del>trans-Nonschler</del>	<del>0.011</del>	
72-55-9	4,4'-DDE	0.096	
60-57-1	Dieldrin	0.012	
72-54-8	4,4'-DDD	0.044	
<del>5103-73-1</del>	<del>cis-Nonschler</del>	<del>0.017</del>	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.020</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40286F

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215588  
Date Received: 10/14/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.10	* EJ
1024-57-3	Heptachlor Epoxide	0.066	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.036</del>	
5103-71-9	alpha-Chlordane	0.021	
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.025</del>	
72-55-9	4,4'-DDE	0.17	* EJ
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.025</del>	
72-54-8	4,4'-DDD	0.076	
5103-73-1	cis-Nonachlor	0.034	
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.033</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUA1  
Contract: 91082  
Case: BIO

K40315F

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215590  
Date Received: 10/14/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.059	J
1024-57-3	Heptachlor Epoxide	0.026	J
5103-74-2	gamma-Chlordane	0.017	JN
5103-71-9	alpha-Chlordane	0.0067	J
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0093</del>	
72-55-9	4,4'-DDE	0.070	J
<del>60-57-1</del>	<del>Dieldrin</del>	<del>0.011</del>	
72-54-8	4,4'-DDD	0.026	
5103-73-1	cis-Nonachlor	0.019	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.014</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40316F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215592  
Date Received: 10/14/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/10/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.035	JN
1024-57-3	Heptachlor Epoxide	0.015	
5103-74-2	gamma-Chlordane	0.015	JN
5103-71-9	alpha-Chlordane	0.0050	U
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0064</del>	
72-55-9	4,4'-DDE	0.065	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	J
<del>5103-73-1</del>	<del>cis-Nonachlor</del>	<del>0.012</del>	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.016</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40317F

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40139

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 215594  
 Date Received: 10/14/93  
 Date Extracted: 04/07/94  
 Date Analyzed: 05/10/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.031	J
1024-57-3	Heptachlor Epoxide	0.014	
5103-74-2	gamma-Chlordane	0.0094	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.043	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0082	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40322FBE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215604R1  
Date Received: 10/14/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.045	J
1024-57-3	Heptachlor Epoxide	0.025	J
5103-74-2	gamma-Chlordane	0.015	J N
5103-71-9	alpha-Chlordane	0.0069	J
39765-80-5	trans-Nonachlor	0.0073	
72-55-9	4,4'-DDE	0.066	J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.021	J
5103-73-1	cis-Nonachlor	0.013	J
50-29-3	4,4'-DDT	0.013	
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40325FBE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215606R1  
Date Received: 10/15/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/25/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.065	J
1024-57-3	Heptachlor Epoxide	0.034	J
5103-74-2	gamma-Chlordane	0.016	
5103-71-9	alpha-Chlordane	0.0076	
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.046	J
60-57-1	Dieldrin	0.010	UJ
72-54-8	4,4'-DDD	0.013	J
5103-73-1	cis-Nonachlor	0.011	JN
50-29-3	4,4'-DDT	0.015	
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R  
R

R

## MERCURY ANALYSES

### Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

#### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

#### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

#### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

One of the CRDL recoveries was above acceptable limits. No data fell in the affected range; therefore, no data qualification was necessary.

**4. Matrix Spike/Laboratory Duplicate**

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

**4.1 Matrix spike**

Recovery for the matrix spike was within acceptable limits.

**4.2 Laboratory Duplicate**

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

**5. Laboratory Control Sample (LCS)**

All recoveries were within the acceptable recovery limits.

**6. Serial Dilution**

No ICP analyses were performed, therefore no serial dilution was necessary.

**7. Furnace QC**

No furnace analyses were performed.

**8. Method of Standard Additions (MSA)**

No MSA were performed.

**9. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u>      </u>	<u>      </u>
Sample No.?	<u>X</u>	<u>      </u>	<u>      </u>
SDG No.?	<u>X</u>	<u>      </u>	<u>      </u>
Correct units?	<u>X</u>	<u>      </u>	<u>      </u>
Matrix?	<u>X</u>	<u>      </u>	<u>      </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u>      </u>	<u>      </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u>      </u>	<u>      </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u>      </u>	<u>      </u>
Is the distillation log for cyanides present?	<u>      </u>	<u>      </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u>      </u>	<u>      </u>
Are the measurement read out records present for:			
ICP	<u>      </u>	<u>      </u>	<u>X</u>
Flame AA	<u>      </u>	<u>      </u>	<u>X</u>
Furnace AA	<u>      </u>	<u>      </u>	<u>X</u>
Mercury	<u>X</u>	<u>      </u>	<u>      </u>
Cyanides	<u>      </u>	<u>      </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u>      </u>	<u>      </u>
Is the data properly labeled?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u>      </u>	<u>      </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

## Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
$\geq$ 100%?			X
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was any sample result higher linear range of ICP.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Corrected Sample Analysis Data Sheets**

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40268F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215570

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40269F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215572

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40270F

Name: AQUATEC Contract: 91082  
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139  
Matrix (soil/water): FISH Lab Sample ID: 215574  
Level (low/med): LOW Date Received: 10/13/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:  
Color After: Clarity After: Artifacts:  
Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40271F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH

Lab Sample ID: 215576

Level (low/med): LOW

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40272F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215578

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.06			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40273F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215580

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40274F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH

Lab Sample ID: 215582

Level (low/med): LOW

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40275F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH

Lab Sample ID: 215584

Level (low/med): LOW

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40284F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215622

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40285F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH

Lab Sample ID: 215586

Level (low/med): LOW

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.06			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40286F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH Lab Sample ID: 215588

Level (low/med): LOW Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40315F

Name: AQUATEC Contract: 91082  
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139  
Matrix (soil/water): FISH Lab Sample ID: 215590  
Level (low/med): LOW Date Received: 10/14/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:  
Color After: Clarity After: Artifacts:  
Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40316F

Sample Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI\_ Case No.: BIO\_ SAS No.: \_\_\_\_\_ SDG No.: 40139\_

Matrix (soil/water): FISH\_ Lab Sample ID: 215592

Level (low/med): LOW\_ Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40317F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139

Matrix (soil/water): FISH

Lab Sample ID: 215594

Level (low/med): LOW

Date Received: 10/14/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40322F

Name: AQUATEC Contract: 91082  
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40139  
Matrix (soil/water): FISH Lab Sample ID: 215604  
Level (low/med): LOW Date Received: 10/14/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		--		NR
7440-36-0	Antimony		--		NR
7440-38-2	Arsenic		--		NR
7440-39-3	Barium		--		NR
7440-41-7	Beryllium		--		NR
7440-43-9	Cadmium		--		NR
7440-70-2	Calcium		--		NR
7440-47-3	Chromium		--		NR
7440-48-4	Cobalt		--		NR
7440-50-8	Copper		--		NR
7439-89-6	Iron		--		NR
7439-92-1	Lead		--		NR
7439-95-4	Magnesium		--		NR
7439-96-5	Manganese		--		NR
7439-97-6	Mercury	0.07	--		CV
7440-02-0	Nickel		--		NR
7440-09-7	Potassium		--		NR
7782-49-2	Selenium		--		NR
7440-22-4	Silver		--		NR
7440-23-5	Sodium		--		NR
7440-28-0	Thallium		--		NR
7440-62-2	Vanadium		--		NR
7440-66-6	Zinc		--		NR
	Cyanide		--		NR

Color Before: Clarity Before: Texture:  
Color After: Clarity After: Artifacts:  
Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40325F

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_  
Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40139 \_\_\_\_\_  
Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 215606  
Level (low/med): LOW \_\_\_\_\_ Date Received: 10/15/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_  
Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**MISCELLANEOUS PARAMETERS**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40271FBE

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40139

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 215576R1  
Date Received: 10/13/93  
Date Extracted: 04/07/94  
Date Analyzed: 05/24/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.045	J
1024-57-3	Heptachlor Epoxide	0.023	J
5103-74-2	gamma-Chlordane	0.013	
5103-71-9	alpha-Chlordane	0.0064	J
39765-80-5	trans-Nonachlor	0.0076	
72-55-9	4,4'-DDE	0.059	J
60-57-1	Dieldrin	0.010	UJ
72-54-8	4,4'-DDD	0.027	J
5103-73-1	cis-Nonachlor	0.0069	JN
50-28-3	4,4'-DDT	0.010	
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

R

R

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Body
K40268	Carp	female	748g	0.80	0.70
K40269	Carp	female	839g	1.06	0.96
K40270	Carp	female	635g	3.88	4.30
K40271	Carp	female	586g	1.78	4.90
K40272	Carp	female	463g	0.90	1.30
K40273	Carp	female	438g	0.94	3.60
K40274	Carp	female	364g	2.76	7.60
K40275	Carp	female	547g	2.51	6.60
K40284	Carp	male	405g	2.16	10.4
K40285	Carp	female	680g	2.01	2.62
K40286	Carp	female	606g	6.84	12.3
K40315	Carp	female	549g	0.97	2.53
K40316	Carp	female	710g	0.66	1.29
K40317	Carp	female	837g	0.51	1.18
K40322	Carp	female	281g	1.32	4.21
K40325	Carp	female	715g	0.60	0.92

**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40191**

**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40191 for the biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and qualified sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40303F	208761	bass	fillet	Trowbridge Dam	x	x
K40303R	208762	bass	carcass	Trowbridge Dam		x
K40307F	208763	bass	fillet	Trowbridge Dam	x	x
K40307R	208764	bass	carcass	Trowbridge Dam		x
K40323F	208766	bass	fillet	Trowbridge Dam	x	x
K40323R	208767	bass	carcass	Trowbridge Dam		x
K40324F	208768	bass	fillet	Trowbridge Dam	x	x
K40324R	208769	bass	carcass	Trowbridge Dam		x
K40371F	208770	bass	fillet	Plainwell Dam	x	x
K40371R	208771	bass	carcass	Plainwell Dam		x
K40372F	208772	bass	fillet	Plainwell Dam	x	x
K40372R	208773	bass	carcass	Plainwell Dam		x
K40373F	208774	bass	fillet	Plainwell Dam	x	x
K40373R	208775	bass	carcass	Plainwell Dam		x
K40374F	208776	bass	fillet	Plainwell Dam	x	x
K40374R	208777	bass	carcass	Plainwell Dam		x

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

**5. Surrogates / System Monitoring Compounds**

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40372F, K40373 and K40374F. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

**6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

**7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

No matrix spike or matrix spike duplicate was included with this data set.

**8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>      </u>	<u>X</u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>      </u>	<u>      </u>	<u>X</u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  0  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  0  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

# PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>          </u>	<u>          </u>
Do any method/reagent/instrument blanks have positive results?	<u>          </u>	<u>X</u>	<u>          </u>
Do any field/rinse blanks have positive results?	<u>          </u>	<u>          </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>          </u>	<u>          </u>
Aroclor 1221	<u>X</u>	<u>          </u>	<u>          </u>
Aroclor 1232	<u>X</u>	<u>          </u>	<u>          </u>
Aroclor 1242	<u>X</u>	<u>          </u>	<u>          </u>
Aroclor 1248	<u>X</u>	<u>          </u>	<u>          </u>
Aroclor 1254	<u>X</u>	<u>          </u>	<u>          </u>
Instrument Blanks	<u>X</u>	<u>          </u>	<u>          </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>          </u>	<u>          </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>          </u>	<u>          </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>          </u>	<u>          </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>          </u>	<u>          </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>          </u>	<u>          </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>          </u>	<u>          </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40303F	OK for all samples		OK		OK
K40307F					
K40323F					
K40324F					
K40371F					
K40372F		↓ (58)		↓ (59)	
K40373F		↓ (59)		↓ (59)	
K40374F		↓ (59)		↓ (59)	

Surrogate Standards  
 TCX Tetrachloro-m-xylene  
 DCB Decachlorobiphenyl

Qualifiers:  
 D Surrogates diluted out  
 ↑ Recovery high  
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2618  
Column: RTX-35 / RTX-5

Date:	4/30/94 0543	5/4	5/4	5/5	5/5	5/5	5/5
Time:	to 5/1/94 0106	1925	1958	0250	0324	1014	1048
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.2 / 4.4						
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4		3.5				
Aroclor 1248	3.4 / 3.0	4.5		2.0		1.0	
Aroclor 1254	3.1 / 3.6				5.0		
Aroclor 1260	3.8 / 3.4						1.0
Tetrachloro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
Affected Samples:							

# PCB Calibration Summary - Page 2

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:		5/6	5/6	5/7	5/7		
Time:		1401	1435	0044	0119		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		0.5		3.0			
Aroclor 1254			0.5				
Aroclor 1260					6.0		
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40303F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40191

Phase Type: BIOTA

Lab Sample ID: 208761

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/29/94

Dilution Factor: 5.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.71	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Aroclor-1260	0.20	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40307F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40191

Phase Type: BIOTA

Lab Sample ID: 208763

Phase Weight: 10.0 (g)

Date Received: 10/14/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/29/94

Dilution Factor: 5.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.38	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.13	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40323F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40191

**Phase Type:** BIOTA

**Lab Sample ID:** 208766

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 03/29/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/05/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.22	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.52	
11096-82-5	Aroclor-1260	0.050	U

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40324F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40191

**Phase Type:** BIOTA

**Lab Sample ID:** 208768

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 03/29/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/05/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.31	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.089	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40371F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40191

Phase Type: BIOTA

Lab Sample ID: 208770

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 2.0

Date Analyzed: 05/06/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.48	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40372F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40191

Phase Type: BIOTA

Lab Sample ID: 208772

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 5.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	0.41	
11096-82-5	Aroclor-1260	0.13	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40373F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40191

Phase Type: BIOTA

Lab Sample ID: 208774

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 5.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.6	
11097-69-1	Aroclor-1254	0.60	
11096-82-5	Aroclor-1260	0.25	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40374F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40191

**Phase Type:** BIOTA

**Lab Sample ID:** 208776

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 03/30/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/05/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.14	J

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40303F	Aldrin	42.1%
	4,4'-DDE	27.4%
	4,4'-DDT	421.7%
K40307F	Aldrin	40.7%
	4,4'-DDE	26.7%
	4,4'-DDT	464.7%
K40323F	Aldrin	41.9%
	4,4'-DDE	40.0%
K40324F	Aldrin	42.9%
	4,4'-DDE	33.3%
K40371F	Aldrin	90.0%
	4,4'-DDE	64.3%
K40372F	Aldrin	75.9%
	4,4'-DDE	58.6%
K40373F	Aldrin	87.5%
	4,4'-DDE	67.7%
	4,4'-DDT	400.0%
K40374F	Aldrin	81.3%
	4,4'-DDE	35.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

**7. Matrix Spike/Matrix Spike Duplicate**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

No matrix spike or matrix spike duplicate was included in this data set.

**8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>      </u>	<u>      </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>      </u>	<u>X</u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>      </u>	<u>X</u>
Were the method blanks reanalyzed?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>      </u>	<u>X</u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>      </u>	<u>      </u>	<u>X</u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  0  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  0  </u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

# Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
<b><u>Analytical Sequence Check</u></b>			
Is Form VIII present and complete for each column and each period of analyses?	X		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>      </u>	<u>      </u>
Are all samples listed on the form?	<u>X</u>	<u>      </u>	<u>      </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>      </u>	<u>      </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>      </u>	<u>      </u>
GPC calibration (80-110%)	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>      </u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>      </u>	<u>X</u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40303F	OK for all samples	OK	OK	OK	OK
K40307F					
K40323F					
K40324F					
K40371F					
K40372F					
K40373F					
K40374F					

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	4/20/94	4/21	4/21				
Time:	18:50	07:18	10:50				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

# Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404

Column: RTX-35

Date:	4/20/94	4/21	4/21				
Time:	18:59	07:16	10:50				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**Corrected Sample Analysis Data Sheets**

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40303F

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40191

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 208761  
 Date Received: 10/14/93  
 Date Extracted: 03/29/94  
 Date Analyzed: 04/21/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.038	J
1024-57-3	Heptachlor Epoxide	0.033	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.062	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.016	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.023</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40307F

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40191

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 208763  
 Date Received: 10/14/93  
 Date Extracted: 03/29/94  
 Date Analyzed: 04/21/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.027	J
1024-57-3	Heptachlor Epoxide	0.022	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.045	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40323F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40191

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208766  
Date Received: 10/15/93  
Date Extracted: 03/29/94  
Date Analyzed: 04/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.017	J
1024-57-3	Heptachlor Epoxide	0.019	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.020	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40324F

SDG: 40191

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208768  
Date Received: 10/15/93  
Date Extracted: 03/29/94  
Date Analyzed: 04/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.021	U
1024-57-3	Heptachlor Epoxide	0.019	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.033	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40371F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40191

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208770  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 04/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
<del>309-00-2</del>	<del>Aldrin</del>	<del>0.0020</del>	
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.028	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40372F

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40191

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 208772  
 Date Received: 10/16/93  
 Date Extracted: 03/30/94  
 Date Analyzed: 04/21/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.029	JN
1024-57-3	Heptachlor Epoxide	0.035	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.029	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40373F

SDG: 40191

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208774  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 04/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.032	JN
1024-57-3	Heptachlor Epoxide	0.039	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.031	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.018	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40374F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40191

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208776  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 04/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.016	JN
1024-57-3	Heptachlor Epoxide	0.013	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.045	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## MERCURY ANALYSES

### Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

#### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

#### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

#### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

### 4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

#### 4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was outside acceptable limits. No qualifiers have been added to the samples based on the RPDs.

#### 5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

#### 6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

#### 7. Furnace QC

No furnace analyses were performed.

#### 8. Method of Standard Additions (MSA)

No MSA were performed.

#### 9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	X		
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	X		
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	X		

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Inorganic Data Validation Checklist - Page 5**

	YES	NO	NA
each matrix type?	<u>X</u>	<u>          </u>	<u>          </u>
Was field blank used for duplicate analysis?	<u>          </u>	<u>X</u>	<u>          </u>
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	<u>          </u>	<u>X</u>	<u>          </u>
If no, are all results outside the control limits flagged with an * on Form I's and VI?	<u>X</u>	<u>          </u>	<u>          </u>
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?	<u>          </u>	<u>X</u>	<u>          </u>
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	<u>X</u>	<u>          </u>	<u>          </u>
each batch samples digested/distilled?	<u>X</u>	<u>          </u>	<u>          </u>
Is LLCs "Found" value higher than the control limits on Form VII?	<u>          </u>	<u>X</u>	<u>          </u>
Is LCS "Found" lower than the control limits on Form VII?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?	<u>          </u>	<u>          </u>	<u>X</u>
each matrix type?	<u>          </u>	<u>          </u>	<u>X</u>
Was field blank(s) used for Serial Dilution Analysis?	<u>          </u>	<u>          </u>	<u>X</u>
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	<u>          </u>	<u>          </u>	<u>X</u>
Are any % difference values:			
> 10%?	<u>          </u>	<u>          </u>	<u>X</u>
$\geq$ 100%?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Furnace Atomic Absorbtion (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	<u>          </u>	<u>          </u>	<u>X</u>

## Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	_____	_____	X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	_____	_____	X
Is analytical spike recovery outside the control limits (85-115%) for any sample?	_____	_____	X
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	_____	X	_____
If no, is any Form I result coded with "S" or a "+"?	_____	X	_____
Is coefficient of correlation for MSA less than 0.990 for any sample?	_____	_____	X
Was MSA required for any sample but not performed?	_____	X	_____
Is coefficient of correlation for MSA less than 0.995?	_____	_____	X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	_____	_____	X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	_____	_____	X
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	_____	_____	X
If no, was field blank value already rejected due to other QC criteria?	_____	_____	X
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :	_____		
Instrument Detection Limits (quarterly)?	X	_____	_____
ICP Interelement Correlation Factors (annually)?	_____	_____	X
ICP Linear Ranges (quarterly)?	_____	_____	X
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:	_____		
all the analytes?	X	_____	_____
all the instruments used?	X	_____	_____

**Inorganic Data Validation Checklist - Page 7**

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher linear range of ICP.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u>          </u>	<u>          </u>	<u>  X  </u>

**Corrected Sample Analysis Data Sheets**

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40303F

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40191 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 208761

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/14/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.11		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40307F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40191

Matrix (soil/water): FISH

Lab Sample ID: 208763

Level (low/med): LOW

Date Received: 10/14/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40323F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40191

Matrix (soil/water): FISH Lab Sample ID: 208766

Level (low/med): LOW Date Received: 10/15/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.36		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40324F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40191

Matrix (soil/water): FISH Lab Sample ID: 208768

Level (low/med): LOW Date Received: 10/15/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		J N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40371F

Lab Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40191

Matrix (soil/water): FISH

Lab Sample ID: 208770

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40372F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40191

Matrix (soil/water): FISH

Lab Sample ID: 208772

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40373F

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_  
 Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40191 \_\_\_\_\_  
 Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 208774  
 Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93  
 % Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.15		JN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_  
 Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

---



---



---

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40374F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40191

Matrix (soil/water): FISH Lab Sample ID: 208776

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.20		N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## MISCELLANEOUS PARAMETERS

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Remaining Carcass
K40303	Small Mouth Bass	female	227g	1.11	4.3
K40307	Small Mouth Bass	male	148g	0.78	2.0
K40323	Small Mouth Bass	female	174g	0.34	0.83
K40324	Small Mouth Bass	male	147g	0.61	2.73
K40371	Small Mouth Bass	female	219g	1.04	3.5
K40372	Small Mouth Bass	female	194g	1.39	7.4
K40373	Small Mouth Bass	female	265g	1.38	2.9
K40374	Small Mouth Bass	male	230g	0.85	3.2

**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40193**

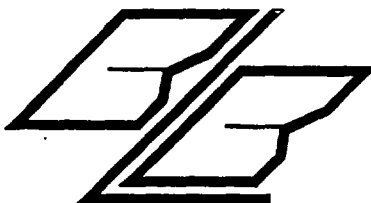
**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40219 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	XUpld
K40333W	201581	White Sucker	whole body	Trowbridge Dam	x	x
K40334W	201582	White Sucker	whole body	Trowbridge Dam	x	x
K40335W	201583	White Sucker	whole body	Trowbridge Dam	x	x
K40336W	201584	White Sucker	whole body	Trowbridge Dam	x	x
K40337W	201585	White Sucker	whole body	Trowbridge Dam	x	x
K40338W	201586	White Sucker	whole body	Trowbridge Dam	x	x
K40376W*	201633	White Sucker	whole body	Plainwell Dam	x	x
K40377W	201634	White Sucker	whole body	Plainwell Dam	x	x
K40378W	201635	White Sucker	whole body	Plainwell Dam	x	x
K40379W	201636	White Sucker	whole body	Plainwell Dam	x	x
K40380W	201637	White Sucker	whole body	Plainwell Dam	x	x

\* MS/MSD/DUP performed on sample

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

### 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## **6. Compound Identification**

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

## **7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank**

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

## **8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40333W	OK for all samples	OK	OK	OK	OK
K40334W					
K40335W					
K40336W					
K40337W					
K40338W					
K40376W					
K40376WMS					
K40376WMSD					
K40377W					
K40378W					
K40379W					
K40380W					

Surrogate Standards  
 TCX Tetrachloro-m-xylene  
 DCB Decachlorobiphenyl

Qualifiers:  
 D Surrogates diluted out  
 † Recovery high  
 ‡ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2618  
 Column: RTX-35 / RTX-5

Date:	5/10/94 1845	5/12	5/12	5/12	5/12	5/13	5/13
Time:	lo 5/11/94 1334	0840	0713	1353	1426	0347	0420
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.6 / 4.6						
Aroclor 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						
Aroclor 1242	2.7 / 2.8		2.5				
Aroclor 1248	3.2 / 2.7	3.0		4.0		1.0	
Aroclor 1254	2.8 / 2.8				1.0		
Aroclor 1260	3.5 / 2.7						4.0
Tetrachloro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40333W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40193

Phase Type: BIOTA

Lab Sample ID: 201581

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.23	
11097-69-1	Aroclor-1254	0.19	
11096-82-5	Aroclor-1260	0.043	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40334W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40193

Phase Type: BIOTA

Lab Sample ID: 201582

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.99	
11096-82-5	Aroclor-1260	0.14	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40335W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201583

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.90	
11096-82-5	Aroclor-1260	0.11	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40336W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201584

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.52	
11096-82-5	Aroclor-1260	0.087	

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40337W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201585

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.10	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40338W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201586

**Phase Weight:** 10.0 (g)

**Date Received:** 10/15/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.30	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.12	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40376W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201633

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/12/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.71	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.10	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40377W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201634

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.99	
11097-69-1	Aroclor-1254	0.95	
11096-82-5	Aroclor-1260	0.18	

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40378W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201635

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.4	
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.23	J

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40379W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40193

**Phase Type:** BIOTA

**Lab Sample ID:** 201636

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/14/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/13/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.2	
11097-69-1	Aroclor-1254	0.90	
11096-82-5	Aroclor-1260	0.25	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40380W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40193

Phase Type: BIOTA

Lab Sample ID: 201637

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.80	
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	U

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exception:

Instrument HP2404 - RTX-5 5/21/94 02:18

2-Bromobiphenyl 65.1%

Data for this compound in the associated samples K40333W, K40334W, K40335W, K40336W, K40337W and K40338W have been qualified as estimated due to the deviation.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40333W	Aldrin	36.8%
	Heptachlor Epoxide	35.0%
	4,4'-DDE	36.8%
K40334W	Aldrin	67.6%
	gamma-Chlordane	97.9%
	4,4'-DDE	43.5%
	4,4'-DDT	591.1%
K40335W	Aldrin	66.1%
	gamma-Chlordane	65.1%
	4,4'-DDE	41.7%
	4,4'-DDT	550.3%
K40336W	Aldrin	42.4%
	gamma-Chlordane	70.4%
	4,4'-DDE	43.4%
K40337W	Aldrin	54.9%
	Heptachlor Epoxide	31.6%
	gamma-Chlordane	92.1%
	4,4'-DDE	38.5%
K40338W	Aldrin	34.3%
	Heptachlor Epoxide	53.8%
	gamma-Chlordane	122.9%
	4,4'-DDE	32.5%
K40376W	Aldrin	34.2%
	gamma-Chlordane	142.8%
	trans-Nonachlor	305.1%
	4,4'-DDE	49.2%
	4,4'-DDT	608.4%

K40377W	Aldrin	27.1%
	gamma-Chlordane	127.3%
	trans-Nonachlor	337.1%
	4,4'-DDE	53.6%
	4,4'-DDT	624.7%
K40378W	Aldrin	29.0%
	gamma-Chlordane	155.7%
	trans-Nonachlor	304.1%
	4,4'-DDE	51.5%
	4,4'-DDT	627.1%
K40379W	Aldrin	36.1%
	gamma-Chlordane	157.4%
	trans-Nonachlor	356.1%
	4,4'-DDE	45.6%
	4,4'-DDT	617.7%
K40380W	Aldrin	38.5%
	gamma-Chlordane	140.4%
	trans-Nonachlor	343.0%
	4,4'-DDE	47.4%
	cis-Nonachlor	612.1%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

#### 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All spike recoveries except Lindane in the matrix spike duplicate were above the acceptable control limit. The elevated recoveries can be attributed to positive interference from PCBs present in the matrix spike. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers have been added to the samples based on matrix spike performance.

#### 8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>          </u>	<u>          </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>          </u>	<u>          </u>
Are the outliers correctly marked with an asterisk?	<u>          </u>	<u>          </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>          </u>	<u>X</u>	<u>          </u>
If yes, were the samples reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
Were the method blanks reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>          </u>	<u>          </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>          </u>	<u>          </u>
How many spike recoveries were outside of QC limits?			
<u>7</u> out of <u>8</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>4</u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>          </u>	<u>          </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>          </u>	<u>          </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>          </u>	<u>          </u>

**Pesticide/PCB Data Validation Checklist - Page 2**

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>          </u>	<u>          </u>
Do any method/reagent/instrument blanks have positive results?	<u>          </u>	<u>X</u>	<u>          </u>
Do any trip/field/rinse blanks have positive results?	<u>          </u>	<u>          </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u>          </u>	<u>          </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u>          </u>	<u>          </u>
Toxaphene multipoint calibration	<u>X</u>	<u>          </u>	<u>          </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u>          </u>	<u>          </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u>          </u>	<u>          </u>
instrument blanks	<u>X</u>	<u>          </u>	<u>          </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u>          </u>	<u>          </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>	<u>          </u>	<u>          </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u>          </u>	<u>          </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u>          </u>	<u>          </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u>          </u>	<u>X</u>	<u>          </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>          </u>	<u>X</u>	<u>          </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u>          </u>	<u>          </u>
Are RPD values for all compounds < 25%?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Analytical Sequence Check</u></b>			

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u>          </u>	<u>          </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>          </u>	<u>          </u>
Are all samples listed on the form?	<u>X</u>	<u>          </u>	<u>          </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>          </u>	<u>          </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>          </u>	<u>          </u>
GPC calibration (80-110%)	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>          </u>	<u>          </u>
Was GC/MS confirmation provided when required?	<u>          </u>	<u>          </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>          </u>	<u>X</u>	<u>          </u>
Were there any false negatives?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>          </u>	<u>          </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>          </u>	<u>X</u>	<u>          </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40333W	OK for all samples	OK	OK	OK	OK
K40334W					
K40335W					
K40336W					
K40337W					
K40338W					
K40376W					
K40376WMS					
K40376WMSD					
K40377W					
K40378W					
K40379W					
K40380W					

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404  
 Column: RTX-5

Date:	5/17/94	5/21	5/21	5/22	5/24	5/25
Time:	17:19	02:18	10:37	10:29	09:01	00:48
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	65.1	ok	ok	ok	ok
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:		K40333W				
		K40334W				
		K40335W				
		K40336W				
		K40337W				
		K40338W				

# Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404

Column: RTX-35

Date:	5/17/94	5/21	5/21	5/22	5/24	5/25
Time:	17:19	02:18	10:37	10:29	09:01	00:48
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:						

**Corrected Sample Analysis Data Sheets**

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40333W

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40193

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201581  
 Date Received: 10/15/93  
 Date Extracted: 04/14/94  
 Date Analyzed: 05/21/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	J
1024-57-3	Heptachlor Epoxide	0.011	J
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.011	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40334W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201582  
Date Received: 10/15/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	JN
1024-57-3	Heptachlor Epoxide	0.011	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0076</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.034	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.012</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40335W

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201583  
Date Received: 10/15/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.017	JN
1024-57-3	Heptachlor Epoxide	0.013	
5103-74-2	gamma-Chlordane	0.0079	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.031	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.011	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40336W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201584  
Date Received: 10/15/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.013	J
1024-57-3	Heptachlor Epoxide	0.0090	
5103-74-2	gamma-Chlordane	0.0051	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.015	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40337W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201585  
Date Received: 10/15/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J.
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.014	JN
1024-57-3	Heptachlor Epoxide	0.012	J
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0063</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40338W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201586  
Date Received: 10/15/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.019	J
1024-57-3	Heptachlor Epoxide	0.016	JN
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0050</del>	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40376W

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201633  
Date Received: 10/16/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.040	J
1024-57-3	Heptachlor Epoxide	0.034	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.014</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>39765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.010</del>	
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.016	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.012</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40377W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201634  
Date Received: 10/16/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.044	J
1024-57-3	Heptachlor Epoxide	0.038	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.015</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.0007</del>	
72-55-9	4,4'-DDE	0.045	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.016	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.013</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40378W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201635  
Date Received: 10/16/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.052	J
1024-57-3	Heptachlor Epoxide	0.043	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.017</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.011</del>	
72-55-9	4,4'-DDE	0.047	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.018	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-28-3</del>	<del>4,4'-DDT</del>	<del>0.014</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40379W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201636  
Date Received: 10/16/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.060	J
1024-57-3	Heptachlor Epoxide	0.047	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.017</del>	
5103-71-9	alpha-Chlordane	0.0050	U
<del>20765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.010</del>	
72-55-9	4,4'-DDE	0.045	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.019	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.012</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40380W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40193

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201637  
Date Received: 10/16/93  
Date Extracted: 04/14/94  
Date Analyzed: 05/21/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.035	J
1024-57-3	Heptachlor Epoxide	0.029	
5103-74-2	gamma-Chlordane	0.012	
5103-71-9	alpha-Chlordane	0.0050	U
30765-80-5	trans-Nonachlor	0.0088	
72-55-9	4,4'-DDE	0.038	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.014	
5103-73-1	cis-Nonachlor	0.0050	U
50-28-3	4,4'-DDT	0.011	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

## MERCURY ANALYSES

### Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

#### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

#### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

#### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

The CRDL standard recovery was slightly above the acceptable limit. No data fell in the affected range; therefore, no qualifiers were added to the samples.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	X		
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	X		
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	X		

# Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
$\geq$ 100%?			X
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher linear range of ICP.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u>          </u>	<u>          </u>	<u>  X  </u>

**Corrected Sample Analysis Data Sheets**

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40333W

Name: AQUATEC Contract: 91082  
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193  
Matrix (soil/water): FISH Lab Sample ID: 201581  
Level (low/med): LOW Date Received: 10/15/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:  
Color After: Clarity After: Artifacts:  
Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40334W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40193

Matrix (soil/water): FISH

Lab Sample ID: 201582

Level (low/med): LOW

Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40335W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201583

Level (low/med): LOW Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40336W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201584

Level (low/med): LOW Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.04	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40337W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201585

Level (low/med): LOW Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40338W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201586

Level (low/med): LOW Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40376W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201633

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40377W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201634

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40378W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40193

Matrix (soil/water): FISH

Lab Sample ID: 201635

Level (low/med): LOW

Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before: .

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40379W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40193

Matrix (soil/water): FISH Lab Sample ID: 201636

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40380W

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40193 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201637

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		--		NR
7440-36-0	Antimony		--		NR
7440-38-2	Arsenic		--		NR
7440-39-3	Barium		--		NR
7440-41-7	Beryllium		--		NR
7440-43-9	Cadmium		--		NR
7440-70-2	Calcium		--		NR
7440-47-3	Chromium		--		NR
7440-48-4	Cobalt		--		NR
7440-50-8	Copper		--		NR
7439-89-6	Iron		--		NR
7439-92-1	Lead		--		NR
7439-95-4	Magnesium		--		NR
7439-96-5	Manganese		--		NR
7439-97-6	Mercury	0.02	--		CV
7440-02-0	Nickel		--		NR
7440-09-7	Potassium		--		NR
7782-49-2	Selenium		--		NR
7440-22-4	Silver		--		NR
7440-23-5	Sodium		--		NR
7440-28-0	Thallium		--		NR
7440-62-2	Vanadium		--		NR
7440-66-6	Zinc		--		NR
	Cyanide		--		NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

**MISCELLANEOUS PARAMETERS**

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40333W	Trowbridge Dam - White Sucker	male	0.88
K40334W	Trowbridge Dam - White Sucker	male	0.83
K40335W	Trowbridge Dam - White Sucker	male	0.59
K40336W	Trowbridge Dam - White Sucker	male	0.55
K40337W	Trowbridge Dam - White Sucker	male	1.01
K40338W	Trowbridge Dam - White Sucker	male	1.29
K40376W	Plainwell Dam - White Sucker	male	3.40
K40377W	Plainwell Dam - White Sucker	male	3.30
K40378W	Plainwell Dam - White Sucker	male	3.78
K40379W	Plainwell Dam - White Sucker	female	2.76
K40380W	Plainwell Dam - White Sucker	female	2.96



**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40202**

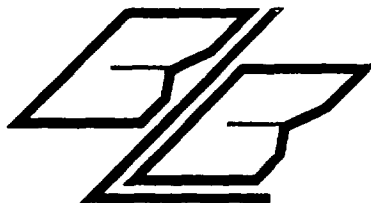
**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40202 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					PCB	%Lipid
K40360F	208350	carp	fillet	Plainwell Dam	x	x
K40360R	208351	carp	carcass	Plainwell Dam		x
K40365F	208352	carp	fillet	Plainwell Dam	x	x
K40365R	208353	carp	carcass	Plainwell Dam		x
K40366F	208354	carp	fillet	Plainwell Dam	x	x
K40366R	208355	carp	carcass	Plainwell Dam		x
K40367F	208356	carp	fillet	Plainwell Dam	x	x
K40367R	208357	carp	carcass	Plainwell Dam		x
K40368F	208358	carp	fillet	Plainwell Dam	x	x
K40368R	208359	carp	carcass	Plainwell Dam		x
K40391F	208360	carp	fillet	Mosel Ave.	x	x
K40391R	208361	carp	carcass	Mosel Ave.		x
K40424F	208364	carp	fillet	Ceresco	x	x
K40424R	208365	carp	carcass	Ceresco		x
K40425F	208366	carp	fillet	Ceresco	x	x
K40425R	208367	carp	carcass	Ceresco		x
K40426F*	208368	carp	fillet	Ceresco	x	x
K40426R	208369	carp	carcass	Ceresco		x
K40429F	214892	carp	fillet	Ceresco Reservoir	x	x
K40429R	214892	carp	carcass	Ceresco Reservoir		x
K40431F	214893	carp	fillet	Ceresco Reservoir	x	x
K40431R	214894	carp	carcass	Ceresco Reservoir		x

\* MS/MSD/DUP performed on sample

## PCB ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40360F, K40366F, K40368F, K40391F and K40426MSD. No qualifiers were added to these samples based on the deviations. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>0</u> out of <u>4</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>2</u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?*	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>      </u>	<u>      </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>      </u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40360F	OK for all samples	↓ (52)	OK	↓ (57)	OK
K40365F					
K40366F		↓ (55)			
K40267F					
K40368F		↓ (56)			
K40391F		↓ (56)		↓ (57)	
K40424F					
K40425F					
K40426F					
K40426FMS					
K40426FMSD		↓ (53)			
K40429F					
K40431F					

## Surrogate Standards

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

## Qualifiers:

D Surrogates diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

# PCB Calibration Summary

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:	5/1/94 2255	5/3	5/3	5/4	5/4	5/4	5/4
Time:	to 5/2/94 1916	1948	2024	0355	0411	1122	1158
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	5.7 / 4.0				6.5		
Aroclor 1221	6.4 / 3.4						
Aroclor 1232	4.1 / 2.5						
Aroclor 1242	4.6 / 4.2						11.0
Aroclor 1248	5.1 / 4.5	3.5		9.5		8.5	
Aroclor 1254	4.9 / 4.8						
Aroclor 1260	3.6 / 3.0		4.0				
Tetrachloro-m-xylene	6.6 / 4.5						
Decachlorobiphenyl	6.5 / 8.5						
Affected Samples:							

# PCB Calibration Summary - Page 2

Instrument: HP2087  
 Column: RTX-35 / RTX-5

Date:		5/4	5/4	5/5	5/5	5/6	5/6
Time:		1833	1908	1752	1828	0243	0319
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242					15.0		
Aroclor 1248		5.5		14.5		13.5	
Aroclor 1254			9.5				11.5
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40360F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208350

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 10.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	3.6	
11097-69-1	Aroclor-1254	3.1	
11096-82-5	Aroclor-1260	0.50	U

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40365F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208352

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.8	
11097-69-1	Aroclor-1254	2.1	
11096-82-5	Aroclor-1260	0.25	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40366F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40202

**Phase Type:** BIOTA

**Lab Sample ID:** 208354

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 03/30/94

**Dilution Factor:** 10.0

**Date Analyzed:** 05/04/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	2.8	
11096-82-5	Aroclor-1260	1.4	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40367F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208356

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 2.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	0.91	
11096-82-5	Aroclor-1260	0.15	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40368F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208358

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 10.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	4.2	
11097-69-1	Aroclor-1254	2.5	
11096-82-5	Aroclor-1260	0.50	U

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40391F**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40202

**Phase Type:** BIOTA

**Lab Sample ID:** 208360

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 03/30/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/04/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.51	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.9	
11096-82-5	Aroclor-1260	0.18	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40424F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208364

Phase Weight: 10.0 (g)

Date Received: 11/10/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.093	
11096-82-5	Aroclor-1260	0.076	

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40425F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208366

Phase Weight: 10.0 (g)

Date Received: 11/10/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.047	J
11096-82-5	Aroclor-1260	0.036	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40426F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 208368

Phase Weight: 10.0 (g)

Date Received: 11/10/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.030	J
11096-82-5	Aroclor-1260	0.025	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40429F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 214891

Phase Weight: 10.0 (g)

Date Received: 11/10/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.062	
11096-82-5	Aroclor-1260	0.039	J

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40431F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40202

Phase Type: BIOTA

Lab Sample ID: 214893

Phase Weight: 10.0 (g)

Date Received: 11/10/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.030	J
11096-82-5	Aroclor-1260	0.027	J

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding times. The dilutions of samples K40365F and K40368F were, however, analyzed over the specified holding time. All data for the dilutions have been qualified as estimated based on the deviation.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

## 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

## 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40360F	2-Bromobiphenyl	151.9%
	Aldrin	30.7%
	gamma-Chlordane	88.5%
	4,4'-DDE	32.0%
	cis-Nonachlor	32.4%
	4,4'-DDT	652.8%
K40365F	Aldrin	30.5%
	gamma-Chlordane	71.0%
	4,4'-DDE	40.2%
	cis-Nonachlor	44.4%
	4,4'-DDT	620.0%
K40365FDL	2-Bromobiphenyl	151.9%
	Aldrin	31.1%
	Heptachlor Epoxide	30.0
	gamma-Chlordane	75.0%
	4,4'-DDE	41.8%
	cis-Nonachlor	26.1%
	4,4'-DDT	728.6%
K40366F	2-Bromobiphenyl	142.4%
	3-Bromobiphenyl	144.0%
	Aldrin	32.5%
	gamma-Chlordane	100.0%
	4,4'-DDE	29.9%
	4,4'-DDT	363.1%
K40367F	Aldrin	35.0%
	gamma-Chlordane	71.4%
	4,4'-DDE	41.9%

K40368F	3-Bromobiphenyl	62.2%
	Heptachlor Epoxide	25.5%
	gamma-Chlordane	112.5%
	4,4'-DDE	58.8%
	4,4'-DDT	572.7%
K40368FDL	Aldrin	29.0%
	Heptachlor Epoxide	37.3%
	gamma-Chlordane	95.2%
	4,4'-DDE	60.2%
	4,4'-DDT	680.0%
K40391F	Aldrin	37.8%
	gamma-Chlordane	82.4%
	4,4'-DDE	32.9%
	cis-Nonachlor	61.5%
	4,4'-DDT	600.0%
K40424F	2-Bromobiphenyl	32.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

#### 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries were above the acceptable control limits. All recoveries in the matrix spike blank were, however, within acceptable control limits. The elevated matrix spike recoveries are believed to be attributable to both positive interference from the sample matrix and partial evaporation of the spike extracts after concentration. No qualifiers were added to the samples based on matrix spike performance.

#### 8. General Comments

The recommended data usage for the sample dilutions is as follows:

##### K40365F and K40365FDL

The data from sample K40365F should be used for all compounds except Aldrin. The data from the dilution K40365FDL should be used for Aldrin only.

##### K40368F and K40368FDL

The data from sample K40368F should be used for all compounds except Aldrin. The data from the dilution K40368FDL should be used for Aldrin only.

## **9. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>          </u>	<u>          </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>          </u>	<u>          </u>
Are the outliers correctly marked with an asterisk?	<u>          </u>	<u>          </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>          </u>	<u>X</u>	<u>          </u>
If yes, were the samples reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
Were the method blanks reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>          </u>	<u>          </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>          </u>	<u>          </u>
How many spike recoveries were outside of QC limits?			
<u>  8  </u> out of <u>  8  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>          </u>	<u>          </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>          </u>	<u>          </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>          </u>	<u>          </u>

# Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
<b><u>Analytical Sequence Check</u></b>			
Is Form VIII present and complete for each column and each period of analyses?	X		

# Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>      </u>	<u>      </u>
Are all samples listed on the form?	<u>X</u>	<u>      </u>	<u>      </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>      </u>	<u>      </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>      </u>	<u>      </u>
GPC calibration (80-110%)	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>      </u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>      </u>	<u>X</u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40360F		OK	OK	OK	OK
K40365F					
K40365FDL	+1				
K40366F					
K40367F					
K40368F					
K40368FDL	+1				
K40391F					
K40424F					
K40425F					
K40426F					
K40426FMS					
K40426FMSD					
K40429F					
K40431F					

**Surrogates:**

TCX Tetrachloro-m-xylene

DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out

↑ Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	4/26/94	5/2	5/2	5/2			
Time:	20:30	01:43	14:08	22:28			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

# Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404  
 Column: RTX-35

Date:	4/26/94	5/2	5/2	5/2			
Time:	20:30	01:43	14:08	22:28			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404  
 Column: RTX-5

Date:	5/8/94	5/9	5/10				
Time:	17:57	18:35	02:55				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404  
 Column: RTX-35

Date:	5/8/94	5/9	5/10				
Time:	17:57	18:35	02:55				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**Corrected Sample Analysis Data Sheets**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

<p>Lab Name: <u>Aquatec, Inc.</u></p> <p>Lab Code: <u>AQUAI</u></p> <p>Contract: <u>91082</u></p> <p>Case: <u>BIO</u></p> <p>Phase Type: <u>Biota</u></p> <p>Phase Weight: <u>10.0 g</u></p> <p>Extraction: <u>Soxhlet</u></p> <p>Dilution Factor: <u>2.0</u></p>	<p style="text-align: right;">Client ID No.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">K40360F</div> <p>SDG: <u>40202</u></p> <p>Lab Sample ID: <u>208350</u></p> <p>Date Received: <u>10/16/93</u></p> <p>Date Extracted: <u>03/30/94</u></p> <p>Date Analyzed: <u>05/09/94</u></p> <p>Sulfur Clean-up: <u>N</u></p>
--	--

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
<del>2052-07-5</del>	<del>2-Bromobiphenyl</del>	<del>0.054</del>	
2113-57-7	3-Bromobiphenyl	0.020	U
92-66-0	4-Bromobiphenyl	0.020	U
118-74-1	Hexachlorobenzene	0.010	U
58-89-9	gamma-BHC	0.010	U
309-00-2	Aldrin	0.16	* EJ
1024-57-3	Heptachlor Epoxide	0.11	
5103-74-2	gamma-Chlordane	0.061	JN
5103-71-9	alpha-Chlordane	0.049	
39765-80-5	trans-Nonachlor	0.010	U
72-55-9	4,4'-DDE	0.18	J
60-57-1	Dieldrin	0.020	U
72-54-8	4,4'-DDD	0.072	
5103-73-1	cis-Nonachlor	0.037	J
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.036</del>	
36355-01-8	Hexabromobiphenyl	0.040	U
8001-35-2	Toxaphene	0.40	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40365F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208352  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.10 <del>0.082</del>	<del>X</del> DJ
1024-57-3	Heptachlor Epoxide	0.043	
5103-74-2	gamma-Chlordane	0.031	JN
5103-71-9	alpha-Chlordane	0.022	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.087	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.035	
5103-73-1	cis-Nonachlor	0.018	J
<del>50-28-3</del>	<del>4,4' DDT</del>	<del>0.020</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40366F

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208354  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
<del>2052-07-5</del>	<del>2-Bromobiphenyl</del>	<del>0.059</del>	
<del>2113-57-7</del>	<del>3-Bromobiphenyl</del>	<del>0.025</del>	
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.077	J
1024-57-3	Heptachlor Epoxide	0.047	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.025</del>	
5103-71-9	alpha-Chlordane	0.013	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.13	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.0050	U
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.036</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40367F

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40202

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 208356  
 Date Received: 10/16/93  
 Date Extracted: 03/30/94  
 Date Analyzed: 05/02/94  
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.040	J
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.014	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.013	
5103-73-1	cis-Nonachlor	0.013	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40368F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208358  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.0074	JN
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.14 <del>0.11</del>	<del>X</del> DJ
1024-57-3	Heptachlor Epoxide	0.055	J
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.032</del>	
5103-71-9	alpha-Chlordane	0.015	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.068	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.026	
5103-73-1	cis-Nonachlor	0.025	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.022</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40391F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208360  
Date Received: 10/16/93  
Date Extracted: 03/30/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.040	
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	J
1024-57-3	Heptachlor Epoxide	0.020	JN
5103-74-2	gamma-Chlordane	0.017	
5103-71-9	alpha-Chlordane	0.015	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.076	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.013	JN
50-29-3	4,4' DDT	0.016	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40424F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208364  
Date Received: 11/10/93  
Date Extracted: 03/31/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.043	J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.052	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40425F

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208366  
Date Received: 11/10/93  
Date Extracted: 03/31/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40426F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 208368  
Date Received: 11/10/93  
Date Extracted: 03/31/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40429F

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40202

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 214891  
Date Received: 11/10/93  
Date Extracted: 03/30/94  
Date Analyzed: 05/02/94  
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.019	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

<p>Lab Name: <u>Aquatec, Inc.</u></p> <p>Lab Code: <u>AQUAI</u></p> <p>Contract: <u>91082</u></p> <p>Case: <u>BIO</u></p> <p>Phase Type: <u>Biota</u></p> <p>Phase Weight: <u>10.0 g</u></p> <p>Extraction: <u>Soxhlet</u></p> <p>Dilution Factor: <u>1.0</u></p>	<p style="text-align: right;">Client ID No.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">K40431F</div> <p>SDG: <u>40202</u></p> <p>Lab Sample ID: <u>214893</u></p> <p>Date Received: <u>11/10/93</u></p> <p>Date Extracted: <u>03/30/94</u></p> <p>Date Analyzed: <u>05/02/94</u></p> <p>Sulfur Clean-up: <u>N</u></p>
--	--

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## MERCURY ANALYSES

## Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

One of the two CRDL standard recoveries was above acceptable limits. No associated data fell in the affected range; therefore, no qualifiers were added to the samples.

**4. Matrix Spike/Laboratory Duplicate**

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

**4.1 Matrix spike**

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

**4.2 Laboratory Duplicate**

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

**5. Laboratory Control Sample (LCS)**

All recoveries were within the acceptable recovery limits.

**6. Serial Dilution**

No ICP analyses were performed, therefore no serial dilution was necessary.

**7. Furnace QC**

No furnace analyses were performed.

**8. Method of Standard Additions (MSA)**

No MSA were performed.

**9. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u>          </u>	<u>          </u>
Sample No.?	<u>X</u>	<u>          </u>	<u>          </u>
SDG No.?	<u>X</u>	<u>          </u>	<u>          </u>
Correct units?	<u>X</u>	<u>          </u>	<u>          </u>
Matrix?	<u>X</u>	<u>          </u>	<u>          </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u>          </u>	<u>          </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u>          </u>	<u>          </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u>          </u>	<u>          </u>
Is the distillation log for cyanides present?	<u>          </u>	<u>          </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u>          </u>	<u>          </u>
Are the measurement read out records present for:			
ICP	<u>          </u>	<u>          </u>	<u>X</u>
Flame AA	<u>          </u>	<u>          </u>	<u>X</u>
Furnace AA	<u>          </u>	<u>          </u>	<u>X</u>
Mercury	<u>X</u>	<u>          </u>	<u>          </u>
Cyanides	<u>          </u>	<u>          </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u>          </u>	<u>          </u>
Is the data properly labeled?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u>          </u>	<u>          </u>

**Inorganic Data Validation Checklist - Page 2**

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)			X
<b>Form III (Initial and Continuing Calibration Blanks)</b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b>Form III (Preparation Blank)</b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?			X
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		X	
greater than 200%?		X	
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	X		

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
$\geq$ 100%?			X
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher linear range of ICP.	<u>          </u>	<u>          </u>	<u>  X  </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u>          </u>	<u>  X  </u>	<u>          </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u>          </u>	<u>          </u>	<u>  X  </u>

**Corrected Sample Analysis Data Sheets**

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40360F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 208350

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

---



---



---



---

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40365F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 208352

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		--		NR
7440-36-0	Antimony		--		NR
7440-38-2	Arsenic		--		NR
7440-39-3	Barium		--		NR
7440-41-7	Beryllium		--		NR
7440-43-9	Cadmium		--		NR
7440-70-2	Calcium		--		NR
7440-47-3	Chromium		--		NR
7440-48-4	Cobalt		--		NR
7440-50-8	Copper		--		NR
7439-89-6	Iron		--		NR
7439-92-1	Lead		--		NR
7439-95-4	Magnesium		--		NR
7439-96-5	Manganese		--		NR
7439-97-6	Mercury	0.13	--	IN	CV
7440-02-0	Nickel		--		NR
7440-09-7	Potassium		--		NR
7782-49-2	Selenium		--		NR
7440-22-4	Silver		--		NR
7440-23-5	Sodium		--		NR
7440-28-0	Thallium		--		NR
7440-62-2	Vanadium		--		NR
7440-66-6	Zinc		--		NR
	Cyanide		--		NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40366F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 208354

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40367F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_

Lab Sample ID: 208356

Level (low/med): LOW \_\_\_\_\_

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40368F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI\_ Case No.: BIO\_ SAS No.: \_\_\_\_\_ SDG No.: 40202\_

Matrix (soil/water): FISH\_

Lab Sample ID: 208358

Level (low/med): LOW\_

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		--		NR
7440-36-0	Antimony		--		NR
7440-38-2	Arsenic		--		NR
7440-39-3	Barium		--		NR
7440-41-7	Beryllium		--		NR
7440-43-9	Cadmium		--		NR
7440-70-2	Calcium		--		NR
7440-47-3	Chromium		--		NR
7440-48-4	Cobalt		--		NR
7440-50-8	Copper		--		NR
7439-89-6	Iron		--		NR
7439-92-1	Lead		--		NR
7439-95-4	Magnesium		--		NR
7439-96-5	Manganese		--		NR
7439-97-6	Mercury	0.06	--	JN	CV
7440-02-0	Nickel		--		NR
7440-09-7	Potassium		--		NR
7782-49-2	Selenium		--		NR
7440-22-4	Silver		--		NR
7440-23-5	Sodium		--		NR
7440-28-0	Thallium		--		NR
7440-62-2	Vanadium		--		NR
7440-66-6	Zinc		--		NR
	Cyanide		--		NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40391F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 208360

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.06		SN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40424F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40202

Matrix (soil/water): FISH Lab Sample ID: 208364

Level (low/med): LOW Date Received: 11/10/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40425F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40202

Matrix (soil/water): FISH Lab Sample ID: 208366

Level (low/med): LOW Date Received: 11/10/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40426F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 208368

Level (low/med): LOW \_\_\_\_\_ Date Received: 11/10/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08		✓N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40429F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40202

Matrix (soil/water): FISH Lab Sample ID: 214891

Level (low/med): LOW Date Received: 11/10/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40431F

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40202 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 214893

Level (low/med): LOW \_\_\_\_\_ Date Received: 11/10/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.06		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**MISCELLANEOUS PARAMETERS**

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Remaining Carcass
K40360	Carp	female	746g	12.03	17.7
K40365	Carp	female	513g	4.09	7.1
K40366	Carp	male	517g	5.90	5.3
K40367	Carp	female	407g	2.21	7.7
K40368	Carp	male	502g	3.84	7.7
K40391	Carp	male	475g	4.32	7.3
K40424	Carp	female	409g	3.19	5.1
K40425	Carp	female	441g	1.44	3.9
K40426	Carp	female	311g	1.08	2.8
K40429	Carp	female	507g	1.30	3.1
K40431	Carp	female	490g	1.44	5.4



**DATA REVIEW FOR  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE**

**SDG# 40219**

**PCB, PESTICIDE AND  
MERCURY ANALYSES**

**BIOTA - FISH**

**Analyses performed by:**

**Aquatec, Inc.  
Colchester, Vermont**

**Review performed by:**



**Blasland, Bouck & Lee, Inc.  
Syracuse, New York**

### Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40219 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40114W	196335	Sucker	whole body	Mosel Ave.	x	x
K40115W*	196336	Sucker	whole body	Mosel Ave.	x	x
K40116W	196337	Sucker	whole body	Mosel Ave.	x	x
K40117W	196338	Sucker	whole body	Mosel Ave.	x	x
K40381W	201638	Sucker	whole body	Plainwell Dam	x	x
K40382W	201639	Sucker	whole body	Plainwell Dam	x	x
K40383W	201640	Sucker	whole body	Plainwell Dam	x	x
K40384W	201641	Sucker	whole body	Plainwell Dam	x	x
K40385W	201642	Sucker	whole body	Plainwell Dam	x	x
K40386W	201643	Sucker	whole body	Plainwell Dam	x	x
K40392W	201644	Sucker	whole body	Mosel Ave.	x	x
K40393W	201645	Sucker	whole body	Mosel Ave.	x	x
K40394W	201646	Sucker	whole body	Mosel Ave.	x	x
K40395W	201647	Sucker	whole body	Mosel Ave.	x	x
K40396W	201648	Sucker	whole body	Mosel Ave.	x	x
K40397W	201649	Sucker	whole body	Mosel Ave.	x	x
K40398W	201650	Sucker	whole body	Mosel Ave.	x	x

\* MS/MSD/DUP performed on sample

**PCB ANALYSES**

### Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

### Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

### Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

## Data Assessment

### 1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

### 3. System Performance

The system performance was acceptable for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

#### 4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40114W and K40115WMSD. No qualifiers were added to the data based on the deviations. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## DATA REVIEW CHECKLIST

# PCB Data Review Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>      </u>	<u>      </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>      </u>	<u>      </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>      </u>	<u>      </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Surrogate Recovery</u></b>			
Are surrogate recovery forms present?	<u>X</u>	<u>      </u>	<u>      </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>      </u>	<u>      </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>      </u>	<u>      </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>      </u>	<u>      </u>
If yes, were the samples reanalyzed?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>      </u>	<u>      </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>      </u>	<u>      </u>
How many spike recoveries were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  2  </u>			
<b><u>Blanks</u></b>			
Is a Method Blank Summary Form present?	<u>X</u>	<u>      </u>	<u>      </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>      </u>	<u>      </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u>      </u>	<u>      </u>
Do any method/reagent/instrument blanks have positive results?	<u>      </u>	<u>X</u>	<u>      </u>
Do any field/rinse blanks have positive results?	<u>      </u>	<u>      </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1221	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1232	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1242	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1248	<u>X</u>	<u>      </u>	<u>      </u>
Aroclor 1254	<u>X</u>	<u>      </u>	<u>      </u>
Instrument Blanks	<u>X</u>	<u>      </u>	<u>      </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u>      </u>	<u>      </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u>      </u>	<u>      </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u>      </u>	<u>      </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u>      </u>	<u>      </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Analytical Sequence Check</u></b>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u>      </u>	<u>      </u>
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<b><u>Cleanup Efficiency Verification</u></b>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u>          </u>	<u>          </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>PCB Identification</u></b>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u>          </u>	<u>          </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u>          </u>	<u>          </u>
Were there any false negatives?	<u>          </u>	<u>X</u>	<u>          </u>
Was GC/MS confirmation provided when required?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>          </u>	<u>          </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>          </u>	<u>          </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>          </u>	<u>X</u>	<u>          </u>

# PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40114W	OK for all samples	↓ (55)	OK	↓ (57)	OK
K40115W					
K40115WMS					
K40225WMSD		↓ (54)			
K40116W					
K40117W					
K40381W					
K40382W					
K40383W					
K40384W					
K40385W					
K40386W					
K40392W					
K40393W					
K40394W					
K40395W					
K40396W					
K40397W					
K40398W					

Surrogate Standards  
 TCX Tetrachloro-m-xylene  
 DCB Decachlorobiphenyl

Qualifiers:  
 D Surrogates diluted out  
 ↑ Recovery high  
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

## PCB Calibration Summary

Instrument: HP2087  
Column: RTX-35 / RTX-5

[illegible]

# PCB Calibration Summary - Page 2

Instrument: HP6087  
 Column: RTX-35 / RTX-5

Date:		5/11	5/11				
Time:		1027	1103				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		7.5					
Aroclor 1254							
Aroclor 1260			6.0				
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

**CORRECTED ANALYSIS SUMMARY FORMS**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40114W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 196335

Phase Weight: 10.0 (g)

Date Received: 09/03/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	1.1	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.7	
11096-82-5	Aroclor-1260	0.25	U

JKW  
~~000004~~

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40115W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 196336

Phase Weight: 10.0 (g)

Date Received: 09/03/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.64	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.0	
11096-82-5	Aroclor-1260	0.24	J

Jun  
000005

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40116W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 196337

Phase Weight: 10.0 (g)

Date Received: 09/03/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.17	J
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.80	
11097-69-1	Aroclor-1254	0.86	
11096-82-5	Aroclor-1260	0.16	J

JLN  
000000

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40117W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 196338

Phase Weight: 10.0 (g)

Date Received: 09/03/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.74	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.16	J

JLV  
~~000007~~

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40381W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201638

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.62	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.11	J

*Ju*

000008

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40382W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40219

**Phase Type:** BIOTA

**Lab Sample ID:** 201639

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/13/94

**Dilution Factor:** 1.0

**Date Analyzed:** 05/10/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.50	
11097-69-1	Aroclor-1254	0.46	
11096-82-5	Aroclor-1260	0.085	

*JCN*  
**000009**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40383W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201640

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.4	
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.21	J

JLW  
000010

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40384W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201641

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.3	
11097-69-1	Aroclor-1254	0.87	
11096-82-5	Aroclor-1260	0.18	

JN  
~~000011~~

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40385W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201642

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.94	
11097-69-1	Aroclor-1254	0.94	
11096-82-5	Aroclor-1260	0.15	

JLN  
~~000012~~

**FORM 1**  
**AROCOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40386W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40219

**Phase Type:** BIOTA

**Lab Sample ID:** 201643

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/13/94

**Dilution Factor:** 5.0

**Date Analyzed:** 05/10/94

**Sulfur Clean-up:** N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	0.77	
11096-82-5	Aroclor-1260	0.15	J

✓✓✓  
000013

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40392W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201644

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.75	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.18	J

JCN  
000014

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40393W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201645

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.71	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.18	J

JCN  
~~000015~~

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40394W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201646

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.48	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.11	J

JCN  
~~0000~~16

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40395W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201647

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.65	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.21	J

UN  
000017

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40396W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201648

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 5.0

Date Analyzed: 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.71	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.15	J

JLN.  
~~000018~~

**FORM 1**  
**AROCLOR ANALYSIS DATA SHEET**

**EPA SAMPLE NO.**

**K40397W**

**Lab Name:** Aquatec, Inc.

**Lab Code:** AQUAI

**Contract:** 91082

**Case:** BIO

**SDG:** 40219

**Phase Type:** BIOTA

**Lab Sample ID:** 201649

**Phase Weight:** 10.0 (g)

**Date Received:** 10/16/93

**Injection Volume:** 1.0 (uL)

**Date Extracted:** 04/13/94

**Dilution Factor:** 2.0

**Date Analyzed:** 05/11/94

**Sulfur Clean-up:** Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.38	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.97	
11096-82-5	Aroclor-1260	0.11	

*JLW*  
**000019**

FORM 1  
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40398W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Phase Type: BIOTA

Lab Sample ID: 201650

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 2.0

Date Analyzed: 05/11/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.21	

JAN  
000020

## PESTICIDE ANALYSES

### Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

### 2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

### 3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

### 4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

#### 4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exceptions:

Instrument HP2404 - RTX-5 5/14/94 00:50

2-Bromobiphenyl 30.6%

The data for this compound in the associated samples K40394W, K40395W and K40396W were qualified as estimated due to the deviation.

Instrument HP2404 - RTX-5 5/20/94 01:18

2-Bromobiphenyl

55.4%

The data for this compound in the associated samples K40397W and K40398W were qualified as estimated due to the deviation.

#### 5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery was above the acceptable control limit for one surrogate in sample K40116W. No qualifiers were added to this sample based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

#### 6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40114W	Aldrin	34.0%
	Heptachlor Epoxide	136.6%
	gamma-Chlordane	127.3%
	alpha-Chlordane	28.6%
	4,4'-DDE	28.7%
	cis-Nonachlor	47.6%
	4,4'-DDT	547.4%
K40115W	Aldrin	51.4%
	Heptachlor Epoxide	88.9%
	gamma-Chlordane	122.9%
	cis-Nonachlor	32.1%
	4,4'-DDT	545.8%
K40116W	Aldrin	38.0%
	Heptachlor Epoxide	60.4%
	gamma-Chlordane	133.3%
	4,4'-DDE	30.5%
	4,4'-DDT	566.7%

K40117W	Aldrin	35.3%
	Heptachlor Epoxide	160.5%
	gamma-Chlordane	126.3%
	4,4'-DDE	53.5%
	4,4'-DDT	646.2%
K40381W	Aldrin	35.3%
	Heptachlor Epoxide	160.5%
	gamma-Chlordane	126.3%
	4,4'-DDE	53.5%
	4,4'-DDT	646.2%
K40382W	Aldrin	42.9%
	Heptachlor Epoxide	2381.0%
	gamma-Chlordane	207.7%
	4,4'-DDE	33.3%
K40383W	Aldrin	32.7%
	Heptachlor Epoxide	807.1%
	gamma-Chlordane	150.0%
	alpha-Chlordane	30.0%
	4,4'-DDE	44.2%
	cis-Nonachlor	41.2%
	4,4'-DDT	586.7%
K40384W	Aldrin	30.2%
	Heptachlor Epoxide	115.2%
	gamma-Chlordane	150.0%
	4,4'-DDE	51.4%
	cis-Nonachlor	28.6%
	4,4'-DDT	636.4%
K40385W	Aldrin	34.6%
	Heptachlor Epoxide	686.4%
	gamma-Chlordane	135.0%
	4,4'-DDE	45.6%
	4,4'-DDT	618.8%
K40386W	Aldrin	28.6%
	Heptachlor Epoxide	83.3%
	gamma-Chlordane	*135.7%
	4,4'-DDE	58.8%
	4,4'-DDT	640.0%
K40392W	Aldrin	43.2%
	Heptachlor Epoxide	100.0%
	gamma-Chlordane	160.0%
	4,4'-DDE	30.0%
	cis-Nonachlor	31.6%
	4,4'-DDT	562.5%

K40393W	Aldrin	28.6%
	Heptachlor Epoxide	987.1%
	gamma-Chlordane	250.0%
	alpha-Chlordane	60.0%
	4,4'-DDE	33.8%
	4,4'-DDT	611.8%
K40394W	Aldrin	46.4%
	Heptachlor Epoxide	2263.6%
	gamma-Chlordane	141.7%
	4,4'-DDE	31.5%
	cis-Nonachlor	35.7%
	4,4'-DDT	608.3%
K40395W	Aldrin	40.5%
	Heptachlor Epoxide	122.6%
	gamma-Chlordane	166.7%
	4,4'-DDE	29.3%
	4,4'-DDT	576.5%
K40396W	Aldrin	44.0%
	Heptachlor Epoxide	104.4%
	gamma-Chlordane	136.4%
	4,4'-DDE	36.4%
	4,4'-DDT	595.5%
K40397W	Aldrin	48.0%
	gamma-Chlordane	150.0%
	trans-Nonachlor	233.3%
	4,4'-DDE	37.2%
	4,4'-DDT	630.0%
K40398W	Aldrin	37.5%
	gamma-Chlordane	131.3%
	trans-Nonachlor	235.7%
	4,4'-DDE	40.7%
	cis-Nonachlor	41.2%
	4,4'-DDT	621.4%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

#### 7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin and Dieldrin were above the acceptable control limit in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers were added to the samples based on matrix spike performance.

#### 8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

## **Data Validation Checksheets**

# Pesticide Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	<u>X</u>	<u>          </u>	<u>          </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u>          </u>	<u>          </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u>          </u>	<u>          </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Holding Times</u></b>			
Have any holding times been exceeded?	<u>          </u>	<u>X</u>	<u>          </u>
<b><u>Surrogate Recovery</u></b>			
Are the surrogate recovery forms present?	<u>X</u>	<u>          </u>	<u>          </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u>          </u>	<u>          </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u>          </u>	<u>          </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u>          </u>	<u>          </u>
If yes, were the samples reanalyzed?	<u>          </u>	<u>X</u>	<u>          </u>
Were the method blanks reanalyzed?	<u>          </u>	<u>          </u>	<u>X</u>
<b><u>Matrix Spikes</u></b>			
Is there a matrix spike recovery form present?	<u>X</u>	<u>          </u>	<u>          </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u>          </u>	<u>          </u>
How many spike recoveries were outside of QC limits?			
<u>  4  </u> out of <u>  8  </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>  0  </u> out of <u>  4  </u>			
<b><u>Blanks</u></b>			
Is the method blank summary form present?	<u>X</u>	<u>          </u>	<u>          </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u>          </u>	<u>          </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u>          </u>	<u>          </u>

**Pesticide/PCB Data Validation Checklist - Page 2**

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
<b><u>Calibration and GC Performance</u></b>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?		X	
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?		X	
<b><u>Analytical Sequence Check</u></b>			
Is Form VIII present and complete for each column and each period of analyses?	X		

# Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Cleanup Efficiency Verification</u></b>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u>      </u>	<u>      </u>
Are all samples listed on the form?	<u>X</u>	<u>      </u>	<u>      </u>
If GPC cleanup was performed, is Form IX-2 present?	<u>      </u>	<u>      </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u>      </u>	<u>      </u>
GPC calibration (80-110%)	<u>      </u>	<u>      </u>	<u>X</u>
<b><u>Pesticide/PBB Identification</u></b>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u>      </u>	<u>      </u>
Was GC/MS confirmation provided when required?	<u>      </u>	<u>      </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u>      </u>	<u>X</u>	<u>      </u>
Were there any false negatives?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Compound Quantitation and Reported Detection Limits</u></b>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u>      </u>	<u>      </u>
<b><u>Chromatogram Quality</u></b>			
Were the baselines stable?	<u>X</u>	<u>      </u>	<u>      </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u>      </u>	<u>X</u>	<u>      </u>
<b><u>Field Duplicates</u></b>			
Where field duplicates submitted with the samples?	<u>      </u>	<u>X</u>	<u>      </u>

**Pesticide/PBB Qualifier Summary  
Holding Time and Surrogates**

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40114W	OK for all samples	OK		OK	
K40115W					
K40115WMS					
K40115WMSD					
K40116W			↑ (154)		↑ (152)
K40117W					
K40381W					
K40382W					
K40383W					
K40384W					
K40385W					
K40386W					
K40392W					
K40393W					
K40394W					
K40395W					
K40396W					
K40397W					
K40398W					

**Surrogates:**

TCX Tetrachloro-m-xylene  
DCB Decachlorobiphenyl

**Qualifiers:**

D Surrogate diluted out  
↑ Recovery high  
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

# Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	5/12/94	5/13	5/13	5/14		
Time:	17:54	08:10	16:30	00:50		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	30.2		
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:				K40394W		
				K40395W		
				K40396W		

# Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404  
Column: RTX-35

Date:	5/12/94	5/13	5/13	5/14		
Time:	17:54	08:10	16:30	00:50		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok		
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:						

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404

Column: RTX-5

Date:	5/17/94	5/19	5/20			
Time:	17:19	16:57	01:18			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	55.4			
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:			K40397W			
			K40398W			

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404  
 Column: RTX-35

Date:	5/17/94	5/19	5/20			
Time:	17:19	16:57	01:18			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok			
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:						

**Corrected Sample Analysis Data Sheets**

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; display: inline-block;">K40114W</div>  SDG: <u>40219</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Lab Sample ID: <u>196335</u> Date Received: <u>09/03/93</u> Date Extracted: <u>04/13/94</u> Date Analyzed: <u>05/13/94</u> Sulfur Clean-up: <u>NO</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.050	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.041</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.022</del>	
5103-71-9	alpha-Chlordane	0.021	J
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.087	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.039	
5103-73-1	cis-Nonachlor	0.021	J
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.018</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40115W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 196336  
Date Received: 09/03/93  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	JN
1024-57-3	Heptachlor Epoxide	0.045	JN
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.022</del>	
5103-71-9	alpha-Chlordane	0.019	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.11	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.035	
5103-73-1	cis-Nonachlor	0.028	J
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.024</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40116W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 196337  
Date Received: 09/03/93  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.050	J
1024-57-3	Heptachlor Epoxide	0.048	JN
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.021</del>	
5103-71-9	alpha-Chlordane	0.016	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.082	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.027	
5103-73-1	cis-Nonachlor	0.022	
<del>50-28-3</del>	<del>4,4' DDT</del>	<del>0.018</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40117W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 196338  
Date Received: 09/03/93  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.041	JN
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.024</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.020</del>	
5103-71-9	alpha-Chlordane	0.010	JN
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.077	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.020	
5103-73-1	cis-Nonachlor	0.021	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40381W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201638  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.051	J
1024-57-3	Heptachlor Epoxide	0.043	
5103-74-2	gamma-Chlordane	0.019	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.043	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.015	
5103-73-1	cis-Nonachlor	0.017	
50-29-3	4,4'-DDT	0.013	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40382W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201639  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.028	J
1024-57-3	Heptachlor Epoxide	0.021	
5103-74-2	gamma-Chlordane	0.0078	
5103-71-9	alpha-Chlordane	0.0057	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.033	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	
5103-73-1	cis-Nonachlor	0.010 <sup>a</sup>	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40383W

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201640  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.052	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.042</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.018</del>	
5103-71-9	alpha-Chlordane	0.010	J
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.052	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.019	
5103-73-1	cis-Nonachlor	0.017	J
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.015</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40384W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 40219

Lab Sample ID: 201641

Date Received: 10/16/94

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.043	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.033</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.014</del>	
5103-71-9	alpha-Chlordane	0.0077	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.037	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.014	
5103-73-1	cis-Nonachlor	0.014	J
<del>50-20-3</del>	<del>4,4' DDT</del>	<del>0.011</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 5px auto;">K40385W</div> SDG: <u>40219</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Lab Sample ID: <u>201642</u> Date Received: <u>10/16/94</u> Date Extracted: <u>04/13/94</u> Date Analyzed: <u>05/13/94</u> Sulfur Clean-up: <u>NO</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.052	J
1024-57-3	Heptachlor Epoxide	0.044	
5103-74-2	gamma-Chlordane	0.020	
5103-71-9	alpha-Chlordane	0.011	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.057	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.021	
5103-73-1	cis-Nonachlor	0.020	
50-29-3	4,4' DDT	0.016	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40386W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201643  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-68-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	J
1024-57-3	Heptachlor Epoxide	0.036	
5103-74-2	gamma-Chlordane	0.014	
5103-71-9	alpha-Chlordane	0.0075	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.034	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.013	
5103-73-1	cis-Nonachlor	0.012	
50-29-3	4,4' DDT	0.010	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40392W

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40219

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201644  
 Date Received: 10/16/94  
 Date Extracted: 04/13/94  
 Date Analyzed: 05/13/94  
 Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.038</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.015</del>	
5103-71-9	alpha-Chlordane	0.011	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.070	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.024	
5103-73-1	cis-Nonachlor	0.019	J
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.016</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40393W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201645  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.031</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0075	JN
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.074	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.022	
5103-73-1	cis-Nonachlor	0.021	
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.017</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40394W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201646  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/13/94  
Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.028	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.022</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.012</del>	
5103-71-9	alpha-Chlordane	0.0079	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.054	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.015	
5103-73-1	cis-Nonachlor	0.014*	J
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.012</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40395W

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

SDG: 40219

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201647  
 Date Received: 10/16/94  
 Date Extracted: 04/13/94  
 Date Analyzed: 05/13/94  
 Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	J
1024-57-3	Heptachlor Epoxide	0.031	
5103-74-2	gamma-Chlordane	0.015	
5103-71-9	alpha-Chlordane	0.010	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.075	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.021	
5103-73-1	cis-Nonachlor	0.021	
50-29-3	4,4'-DDT	0.017	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

## PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
 Lab Code: AQUAI  
 Contract: 91082  
 Case: BIO

K40396W

SDG: 40219

Phase Type: Biota  
 Phase Weight: 10.0 g  
 Extraction: Soxhlet  
 Dilution Factor: 1.0

Lab Sample ID: 201648  
 Date Received: 10/16/94  
 Date Extracted: 04/13/94  
 Date Analyzed: 05/13/94  
 Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.050	J
<del>1024-57-3</del>	<del>Heptachlor Epoxide</del>	<del>0.045</del>	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.022</del>	
5103-71-9	alpha-Chlordane	0.014	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.088	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.038	
5103-73-1	cis-Nonachlor	0.026	
<del>50-29-3</del>	<del>4,4'-DDT</del>	<del>0.022</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R

R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40397W

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201649  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: YES

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.025	J
1024-57-3	Heptachlor Epoxide	0.016	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.0096</del>	
5103-71-9	alpha-Chlordane	0.0087	
<del>30765-80-5</del>	<del>trans-Nensehlor</del>	<del>0.0099</del>	
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.014	
5103-73-1	cis-Nonachlor	0.012*	
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.010</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R  
R  
R

1  
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.  
Lab Code: AQUAI  
Contract: 91082  
Case: BIO

K40398W

SDG: 40219

Phase Type: Biota  
Phase Weight: 10.0 g  
Extraction: Soxhlet  
Dilution Factor: 1.0

Lab Sample ID: 201650  
Date Received: 10/16/94  
Date Extracted: 04/13/94  
Date Analyzed: 05/19/94  
Sulfur Clean-up: YES

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.040	J
1024-57-3	Heptachlor Epoxide	0.025	
<del>5103-74-2</del>	<del>gamma-Chlordane</del>	<del>0.016</del>	
5103-71-9	alpha-Chlordane	0.013	
<del>30765-80-5</del>	<del>trans-Nonachlor</del>	<del>0.014</del>	
72-55-9	4,4'-DDE	0.059	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.021	
5103-73-1	cis-Nonachlor	0.017	J
<del>50-29-3</del>	<del>4,4' DDT</del>	<del>0.014</del>	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

## MERCURY ANALYSES

### Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

#### Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

#### Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- \* Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

#### Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## Data Assessment

### 1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

### 2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

### 3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

#### 3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

#### 3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

#### 3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

### 4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

#### **4.2 Laboratory Duplicate**

The difference between laboratory duplicates was within acceptable limits.

#### **5. Laboratory Control Sample (LCS)**

All recoveries were within the acceptable recovery limits.

#### **6. Serial Dilution**

No ICP analyses were performed, therefore no serial dilution was necessary.

#### **7. Furnace QC**

No furnace analyses were performed.

#### **8. Method of Standard Additions (MSA)**

No MSA were performed.

#### **9. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **Data Validation Checksheets**

# Inorganic Data Validation Checklist

	YES	NO	NA
<b><u>Data Completeness and Deliverables</u></b>			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	X		
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	X		
<b><u>Holding Times</u></b>			
Were mercury analyses performed within 28 days?	X		

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Form I (Final Data)</b>			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Calibration</u></b>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form II A (Initial and Continuing Calibration Verification)</u></b>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
<b>Form II B (CRDL Standards for AA and ICP)</b>			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
<b><u>Form III (Initial and Continuing Calibration Blanks)</u></b>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<b><u>Form III (Preparation Blank)</u></b>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form IV (ICP Interference Check Sample)</u></b>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ( $\pm 20\%$ )?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b><u>Form VI (Lab Duplicates)</u></b>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
<b><u>Form VII (Laboratory Control Sample)</u></b>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<b><u>Form IX (ICP Serial Dilution)</u></b>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
$\geq$ 100%?			X
<b><u>Furnace Atomic Absorption (AA) QC Analysis</u></b>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form VIII (Method of Standard Addition Results)</u></b>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Field Blank</u></b>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X, XI, XII (Verification of Instrumental Parameters)</u></b>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>Form X (Instrument Detection Limits)</u></b>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	_____	X	_____
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	_____	_____	X
Was any sample result higher linear range of ICP.	_____	_____	X
Was any sample result higher than the highest calibration standard for non-ICP parameters?	_____	X	_____
If yes for any of the above, was the sample diluted to obtain the result on Form I?	_____	_____	X

**Corrected Sample Analysis Data Sheets**

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40114W

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40219 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 196335

Level (low/med): LOW \_\_\_\_\_ Date Received: 09/03/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40115W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 196336

Level (low/med): LOW Date Received: 09/03/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40116W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40219

Matrix (soil/water): FISH

Lab Sample ID: 196337

Level (low/med): LOW

Date Received: 09/03/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.01	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40117W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 196338

Level (low/med): LOW Date Received: 09/03/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40381W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40219

Matrix (soil/water): FISH

Lab Sample ID: 201638

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_

Clarity Before: \_\_\_\_\_

Texture: \_\_\_\_\_

Color After: \_\_\_\_\_

Clarity After: \_\_\_\_\_

Artifacts: \_\_\_\_\_

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40382W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 201639

Level (low/med): LOW Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40383W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40219

Matrix (soil/water): FISH

Lab Sample ID: 201640

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40384W

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40219 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201641

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40385W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 201642

Level (low/med): LOW Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40386W

Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40219 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201643

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40392W

.b Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 201644

Level (low/med): LOW Date Received: 10/16/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40393W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40219 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201645

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

---

---

---

---

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40394W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 201646

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40395W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219

Matrix (soil/water): FISH Lab Sample ID: 201647

Level (low/med): LOW Date Received: 10/16/93

\* Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40396W

Name: AQUATEC Contract: 91082  
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 40219  
Matrix (soil/water): FISH Lab Sample ID: 201648  
Level (low/med): LOW Date Received: 10/16/93  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:  
Color After: Clarity After: Artifacts:  
Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40397W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 40219

Matrix (soil/water): FISH

Lab Sample ID: 201649

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1  
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40398W

Lab Name: AQUATEC \_\_\_\_\_ Contract: 91082 \_\_\_\_\_

Lab Code: AQUAI \_\_\_\_\_ Case No.: BIO \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 40219 \_\_\_\_\_

Matrix (soil/water): FISH \_\_\_\_\_ Lab Sample ID: 201650

Level (low/med): LOW \_\_\_\_\_ Date Received: 10/16/93

\* Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: \_\_\_\_\_ Clarity Before: \_\_\_\_\_ Texture: \_\_\_\_\_

Color After: \_\_\_\_\_ Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

**MISCELLANEOUS PARAMETERS**

# MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40114W	Golden Redhorse Sucker	male	5.22
K40115W	Golden Redhorse Sucker	male	5.94
K40116W	Golden Redhorse Sucker	male	3.65
K40117W	Golden Redhorse Sucker	male	2.20
K40381W	Golden Redhorse Sucker	female	3.13
K40382W	Golden Redhorse Sucker	male	1.18
K40383W	Golden Redhorse Sucker	male	2.75
K40384W	Golden Redhorse Sucker	female	2.27
K40385W	Golden Redhorse Sucker	male	1.42
K40386W	Golden Redhorse Sucker	female	2.64
K40392W	Golden Redhorse Sucker	male	4.89
K40393W	Golden Redhorse Sucker	female	4.44
K40394W	Golden Redhorse Sucker	male	2.50
K40395W	Golden Redhorse Sucker	female	3.57
K40396W	Golden Redhorse Sucker	male	4.08
K40397W	Golden Redhorse Sucker	male	2.46
K40398W	Golden Redhorse Sucker	male	3.42